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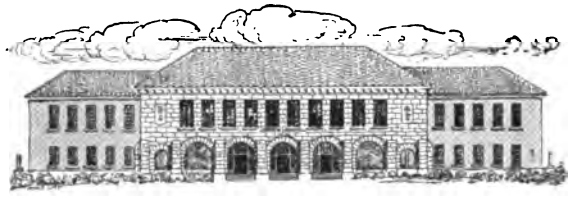

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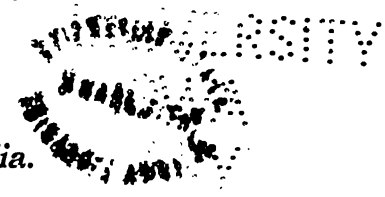

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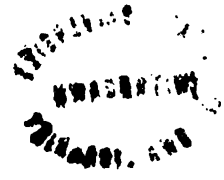

# 1.—MODERN METHODS OF TEACHING ENGLISH IN GERMANY.

BY

J. NELSON FRASER, M.A. (Oxon.),

*Professor of English Literature,*
*Deccan College, Poona.*

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# PREFACE.

THE following Report deals with a visit to German schools, extending from January 21 to April 4, 1905, which was made with the object of observing methods of teaching English in that country. The list of schools to be visited was supplied by the English Education Office, who were also good enough to obtain the necessary permit from the German Government. It is not for me here to express any thanks to that Government; this has already been done by the authorities concerned; but I may say on behalf of myself, and no doubt of all Indian readers, that we warmly appreciate the generosity which allows so great a privilege to foreign visitors.

The list of schools visited included, in Berlin, the Askanisches Gymnasium, the Friedrichs-Realgymnasium, and the XIIth Realschule; in Hamburg, the Uhlenhorst Oberrealschule, the Holstentor Oberrealschule, and two of the primary schools; in Kiel, the Reform Realgymnasium; in Rendsburg, the Royal Realgymnasium; in Cassel, the Oberrealschule; in Weilburg, the Gymnasium; in Frankfort, the Liebig Realschule and the Musterschule; in Wiesbaden, the Oberrealschule. Besides the Principals and members of the staffs of these institutions I must mention among those who assisted me Herr Inspector Fricke and Herr Pechner of Hamburg; Professor Morsbach of Göttingen, Dr. H. Borbein of the Leibnitz-schule in Hanover, and Professor F. J. Curtis of Frankfort. It is impossible for me to speak with

too much gratitude of the kindness of these gentlemen, which in many cases went far beyond the limits of mere civility. They entered heartily into my objects, and did everything possible to serve them. When I have said this, and added another thing that I generally found, a friendly and responsive demeanour on the part of the boys, the reader will readily accept my statement that to anyone interested in education such a visit to Germany, if it falls to his lot, will rank among the pleasantest episodes in his life.

# MODERN METHODS OF TEACHING ENGLISH IN GERMANY.

## Section I.—OBJECTS OF ENGLISH INSTRUCTION IN GERMANY.

WE propose in the following pages to acquaint ourselves in a practical manner with the new methods which many German schools have adopted of teaching the English language.* To understand these methods and appreciate their success we must set out with a clear view of their object. Let us ask therefore *why* English is taught in German schools. It is a question which the German people have definitely asked and answered for themselves, for their system of education does not, as much as those of most countries, retain traditional and conventional elements. Accordingly, the visitor who enquires on this point will readily obtain an answer.

That answer will, in the main, be a 'utilitarian' one. Germany, now, since 1870, for the first time in her history, a united country, finds herself throughout the world face to face with England. This becomes more and more the case as time advances, and the growth of her population compels her to develop her business connections abroad. For the purpose of such connections a knowledge of English has been found indispensable; and this alone would

* The reader should observe that these new methods have been equally applied to French, and it is claimed that they ought to be applied to Greek and Latin also. In this country, however, interest centres on English alone; and for the sake of simplicity I have omitted throughout my report all direct reference to other languages.

account for its place in school curricula. But the same purpose requires something more than a knowledge of the language; it requires a knowledge of the people. Even business purposes call for this, and it is further required by wider considerations, which also proceed from the relations of the two countries. Wherever they meet as rivals, friendly or hostile, they bring with them different systems of culture, different political and social ideals; and Germans are well aware that to deal with these, and, if it be necessary, to overcome them, it is first necessary to understand them. For this purpose, again, a knowledge of the language is thought necessary; it is held with great emphasis that the life and language of a people are so closely interwoven that it is useless to study them apart.

These considerations give us the chief reasons why English is studied at German schools; of course there are also minor reasons. Philology, for instance, in the narrower sense, interests many Germans, and they perceive in the English language a course of development more varied, more active, and more interesting than any visible elsewhere. On the other hand, there is little sympathy with English literature; most of our great authors, like Wordsworth, remain unknown in Germany. The impulse of the day is to study the contemporary life of England. This impulse remains the same, whether it be friendly or hostile; whether it blend with the old cosmopolitan or the new imperial sentiment; whether it spring from business or political necessities or from scientific tastes, as it often does in the mind of the enquiring German observer. For there can be no doubt that thoughtful Germans find English civilization more interesting than any other, because, like the English language, it is more complex and diversified. One may believe, however, that in neglecting English literature they often miss the key to what they see.

Now, if the object of teaching English in German schools was to equip young Germans with a business qualification, it could not long be concealed that this object was not attained. Such a qualification certainly comprises colloquial English, and it became clear, more than twenty years ago, that German schools did not confer

this advantage. The boys who left German schools could neither frame sentences in English nor speak them intelligibly. Nor had they even foundations on which they could build, if they went abroad to improve themselves. They could not lay aside faulty habits of pronunciation, because these had been engrained in youth; and they could not learn the idioms of the foreigners around them, because they could never grasp what they heard. No doubt in these respects they were not worse off than the pupils of English schools, but, unlike them, they suffered from the disadvantage that the rest of the world had not consented to learn German. Fortunately, however, German teachers were equal to the situation. Necessity made good her old proverbial claim, and brought to light, by their agency, the Direct Method of teaching Modern Languages.

The first important date in the history of the Direct Method is 1886, when Professor Vietor, now of Marburg University but then engaged at Liverpool University College, published his famous pamphlet *Der Sprachunterricht muss umkehren*, 'The Teaching of Languages must be revolutionised.' This, though quite a small writing, was a very effective one, and it is still worth reading. It is vigorous and amusing, but perfectly fair in its style and quite remarkable for the way in which it anticipates the arguments and conclusions of the last twenty years. Like all German works on teaching, it digs deep for its foundations; it investigates the nature of speech, and finds that speech is essentially a mode of communication; the mother-speech is learned by the child for this purpose, and we must at least simulate this purpose in teaching a foreign tongue. The mind is reluctant to learn lists of isolated nouns and grammatical rules, and having learned them is unable to apply them for the purpose of speech. If we wish to speak, we must speak from the beginning. Vietor then proposed the Direct Method; the pupil is to learn the foreign language by speaking it; not by learning lists of words, nor by making translations, especially written translations, into or from the new medium.

We need not, however, follow out Vietor's exposition; the principles of the Direct Method remain to be treated in this report later on. It is enough to say that his ideas were warmly

taken up; the scholastic profession of Germany has since 1886 produced men capable of following him. They have not perfected their methods without laborious toil; and they have not succeeded without mistakes on their own part or opposition from the conservatives. Nor is their method yet adopted everywhere; they have not convinced quite all their opponents; and, what is more important, the country does not everywhere produce men capable of the method. This, however, is not a matter with which this report is concerned; it is not a report on the prospects of the Direct Method in Germany, but an account of the method itself, as I witnessed it in some of the schools where it has been adopted and succeeded.

## Section II.—SCHOOL ORGANIZATION AND CURRICULA.

It is now time to give a brief account of the organization of these schools. There are three types of school to be recognised:—

I. *The Gymnasium.*
II. *The Realgymnasium.*
III. *The Oberrealschule.**

The difference between these will be seen from a comparison of their curricula.

---

* 'Gymnasium' is a Greek word and means 'a training ground.' It is the old name for a school in which the Greek and Latin classics form the staple of instruction; and by its meaning it reminds us of the humanistic sentiment pervading this education, which was regarded not as an introduction to business or practical life, but as a process of developing the higher and essentially human powers of man's nature. An Oberrealschule is what we in England call a school giving a modern education; one in which the staple subjects are 'Realien,' or facts of all kinds, historical, scientific, and other. The name corresponds to the aim, which is practical, and connected with the view that a good education should turn out a well-informed man. An Oberrealschule is a school which provides for a complete nine years' course of this education; there are also many Realschulen, in which the course only lasts six years. A Realgymnasium is a compromise between the two systems, in which Latin is retained, and less time is given to modern subjects. In every case the lowest class is known by the number VI; thus the names of the classes, beginning at the bottom, are Sexta (Latin, Sixth); Quinta (Fifth); Quarta (Fourth); Unter-Tertia (Under- or Lower-Third); Ober-Tertia (Upper-Third); Unter-Secunda (Lower-Second); Ober-Secunda; Unter Prima (Lower-First); Prima.

## *I.—The Gymnasium Curriculum.*

| Subject of Instruction. | Number of hours per week. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | O. I. | U. I. | O. II. | U. II. | O. III. | U. III. | IV. | V. | VI. |
| Religion . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| German . . | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 4 |
| Latin . . . | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 |
| Greek . . . | 6 | 6 | 6 | 6 | 6 | 6 | ... | ... | ... |
| French . . | 3 | 3 | 3 | 3 | 2 | 2 | 4 | ... | ... |
| History . . | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Geography . . | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 2 | 2 |
| Mathematics . | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 |
| Physics . . | 2 | 2 | 2 | 2 | 2 | ... | ... | ... | ... |
| Natural Science . | ... | ... | ... | ... | ... | 2 | 2 | 2 | 2 |
| Writing . . | ... | ... | ... | ... | ... | ... | ... | 2 | 2 |
| Drawing . . | ... | ... | ... | ... | 2 | 2 | 2 | 2 | ... |
| Hebrew or English | 2 | 2 | 2 | ... | ... | ... | ... | ... | ... |
| Total . | 32 | 32 | 32 | 30 | 30 | 30 | 29 | 25 | 25 |

## *II.—The Realgymnasium Curriculum.*

We must distinguish two systems: an Old and a New or Reformed System.

### The Old System.

| Subject of Instruction. | Number of hours per week. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | O. I. | U. I. | O. II. | U. II. | O. III. | U. III. | IV. | V. | VI. |
| Religion . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| German . . | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 |
| Latin . . . | 4 | 4 | 4 | 4 | 5 | 5 | 7 | 8 | 8 |
| French . . | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | ... |
| English . . | 3 | 3 | 3 | 3 | 3 | 3 | ... | ... | ... |
| History and Geography . . | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 2 | 2 |
| Mathematics . | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 |
| Natural Science . | 5 | 5 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| Writing . . | ... | ... | ... | ... | ... | ... | ... | 2 | 2 |
| Drawing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | ... |
| Chemistry (optional) | 2 | ... | ... | ... | ... | ... | ... | ... | ... |
| Physics do. . | 2 | 2 | ... | ... | ... | ... | ... | ... | ... |
| Drawing do. . | 2 | 2 | 2 | 2 | 2 | ... | ... | ... | ... |
| Writing do. . | ... | ... | ... | ... | ... | 1 | 1 | 2 | 2 |
| Singing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Total (allowing one optional subject). | 33 | 33 | 34 | 32 | 34 | 33 | 32 | 34 | 29 |

## The Reformed System.

| Subject of Instruction. | Number of hours per week. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | O. I. | U. I. | O. II. | U. II. | O. III. | U. III. | IV. | V. | VI. |
| Religion . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| German . . | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 |
| Latin . . | 5 | 6 | 6 | 6 | 8 | 8 | ... | ... | ... |
| French . . | 3 | 3 | 3 | 3 | 4 | 4 | 6 | 6 | 6 |
| English . . | 4 | 4 | 4 | 6 | ... | ... | ... | ... | ... |
| History . . | 3 | 3 | 3 | 2 | 2 | 2 | 2 | ... | ... |
| Geography . . | ... | ... | ... | 1 | 1 | 2 | 2 | 2 | 2 |
| Mathematics . . | 5 | 5 | 5 | 4 | 4 | 4 | 6 | 5 | 5 |
| Natural Science . | 4 | 4 | 4 | 2 | 4 | 3 | 2 | 2 | 2 |
| Philosophy . . | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| Writing . . | ... | ... | ... | ... | ... | ... | 2 | 2 | 2 |
| Drawing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | ... |
| Do. (optional) . | 2 | 2 | 2 | 2 | 2 | ... | ... | ... | ... |
| Singing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Total . | 36 | 36 | 36 | 35 | 34 | 32 | 30 | 27 | 27 |

Excluding a few possible optional hours not shown above.

## *III.—The Oberrealschule Curriculum.*

| Subject of Instruction. | Number of hours per week. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | O. I. | U. I. | O. II. | U. II. | O. III. | U. III. | IV. | V. | VI. |
| Religion . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| German . . | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 5 |
| French . . | 4 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 6 |
| English . . | 4 | 4 | 4 | 4 | 4 | 5 | ... | ... | ... |
| History . . | 3 | 3 | 3 | 2 | 2 | 2 | 3 | ... | ... |
| Geography . . | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| Mathematics . . | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 5 | 5 |
| Natural Science . | 6 | 6 | 6 | 6 | 4 | 2 | 2 | 2 | 2 |
| Writing . . | ... | ... | ... | ... | ... | ... | 2 | 2 | 2 |
| Drawing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | ... |
| Do. (optional) . | 2 | 2 | 2 | 2 | 2 | ... | ... | ... | ... |
| Singing . . | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Total . | 35 | 35 | 35 | 34 | 34 | 32 | 31 | 27 | 27 |

Excluding a few possible optional hours.

From these curricula * it is easy to perceive in a superficial way the difference between the three types of education represented. The Gymnasia represent the old classical education, of which the staple was the Latin and Greek Languages and Literature. The Oberrealschulen put into the place of these subjects Mathematics, Science, and Modern Languages. Regarding the value of the two systems, as the reader knows, a strenuous conflict of opinions still prevails. On the one side it is urged that the classical education alone really trains the mind, and brings it into contact with inspiring ideas, while the modern system is purely 'Utilitarian,' and overburdened with diverse subjects and interests. On the other side it is replied that the classical education is out of touch with the age, that practical utility is not to be despised, that training and inspiration can be derived from the study of modern languages and literature. Without pursuing the controversy here, it may be observed that each system has compelled the other to meet the charges made against it. The classical course has admitted many modern subjects, so many, that it has become doubtful whether it can attain its own ends in classical studies. The Oberrealschule finds itself obliged to demonstrate the fruitfulness of modern literatures on the spiritual side. This is chiefly done in connection with the study of German itself. The works of Goethe especially are drawn upon, and he plays at present a part in moulding German ideas perhaps greater than any writer has ever played in the history of any other nation. But modern literatures are also drawn upon, to some extent, French and English. I have already said that the great object of modern language teaching in Germany appears to be practical; it is sought, for practical purposes, to equip the nation with a useful knowledge of foreign languages and manners. But something may here be said to qualify this proposition. When for instance an Ober-Prima is found reading Locke's Essay on the Human Understanding, it appears that the object in view is not narrowly practical, but Humanistic; it is sought to bestow a training in thought, and an impulse towards philosophic reflection. Such an effort in an

* The tables here printed are either Prussian or modelled on Prussian lines, which are followed, as a matter of fact, almost everywhere in Germany.

Oberrealschule deserves especial notice; it shows that the leaders of the Reform movement desire that there should be some spirit of culture throughout their proceedings. And of course all knowledge may be pursued as a matter of culture; it is the point of view that makes the difference. Without doubt there are schoolmasters in Germany who teach English and French in a spirit as disinterested as that of any Humanist professor of Greek—but they are the exception. If anyone is disposed to look on this as a censure of Realschulen, he may reflect that individuals and nations have their livings to make, while the pursuit of culture easily degenerates into an imposture.

The reader will also notice the existence of the Realgymnasium. This institution is an attempt to compromise between the claims of classical and modern subjects. It is doubtful whether the attempt is worth making, but the question does not arise in connection with this report. It may be observed that there are two different courses adopted by these schools. The old course begins both Latin and French in the lowest class; the new course postpones Latin to Unter-Tertia. The advantages claimed for this are (i) that it avoids the strain of learning two new languages simultaneously at the age of 11; (ii) that it leaves the question open to the age of 13 whether a boy shall learn Latin at all; he may in the Unter-Tertia decide to take up the Oberrealschule instead of the Realgymnasium course. The objection urged against this course is that it postpones the study of Latin to an age much later than that at which it is usually begun; an objection repeated in the case of English, which the reformed course begins at the age of 16, while the old course begins it at 13. I do not feel that my own observations enable me to judge whether this change is a mistake.* On the whole I think it

* I will ask the reader to believe here and throughout my report that impressions as to the merits of systems are only offered him with due reserve and hesitation. In trying to form such impressions the visitor has not only to weigh what he actually sees, for an hour or two, as the fruits of systems; he has also to allow for the different capacities of the men who follow them; the varying capacities of boys in different classes of society; and the more or less favourable conditions in different parts of Germany.

pays best, in beginning a new language, to devote as much time to it as possible. Children who learn English an hour every day will certainly achieve more than twice as much as others who learn for an hour each alternate day; and probably the four years' course of the New time-table effects as much as the six years' course of the Old time-table.

As for English at the Gymnasia, where it forms an alternative with Hebrew, its position is hopeless. What can be done for the average boy with two hours a week out of thirty-two? A good deal *is* done—much more than one might expect. One finds the victims actually reading in the Ober-Prima Macaulay and Byron; but I cannot believe the foundations of their knowledge are secure; and perhaps I need not say what the more thoughtful schoolmasters really think of their own curriculum. It is not a true educational theory that has produced it, but a conflict of theories, aided by certain survivals of social conventions; and the whole scheme will some day be swept away, when the authorities recognise what it means to teach the average boy five languages, together with Higher Mathematics, Physics, Drawing, and Singing.

One may now say a word with regard to this average boy himself, who remains (unconsciously let us hope) the subject of our speculations and experiments. First, as to his age in the various classes, the following figures may be useful. They are taken from the report of one school, the Uhlenhorst Oberrealschule in Hamburg, but are sufficiently representative of all:—

| Classes. | O. I. | U. I. | O. II. | U. II. | O. III. | U. III. | IV. | V. | VI. |
|---|---|---|---|---|---|---|---|---|---|
| Average age . . . | 19 | 18·5 | 16·9 | 16·9 | 15·4 | 13·1 | 12·1 | 11·1 | 10·7 |

The best time to begin our acquaintance with young Germany is about 7-45 A. M., before the door of his school. We shall then see him marching up for his daily work, carrying his books, if he is a little boy, in a knapsack on his back, as this is the most 'hygienic' plan. In the playground he meets his school fellows, and at 8 o'clock, class by class, they enter the building. If it is one of

the most recent buildings we shall find that the most careful thought has been devoted to making it comfortable and healthy, that it is beautifully decorated and furnished with attractive pictures. We cannot, however, pause over the buildings; turning to the boys, again we observe that they mostly belong to the respectable middle classes, though the upper classes also may be represented, as their sons are often educated at the Gymnasia near their homes. None of the pupils are boarders; they all come from their own homes or from lodgings. They have a long day before them; probably five consecutive hours, with intervals of ten minutes; and each boy brings a packet of sandwiches with him, which he eats in the intervals, as he feels inclined. After 1 or 2 o'clock he goes home, and is free for the rest of the day, except for his home lessons. He does not, however, like the English boy, play a game of any kind in the afternoon; games are almost unknown in Germany; their place is taken by a gymnastic course of three hours a week at the school.

Inside their class-rooms, German boys seem to be happy and well treated. Discipline is systematic, and therefore not harsh. The boys are trained from the beginning in habits of industry—not, however, by the motive of emulation, for few lists of marks are kept, none are published, and prizes are exceptional luxuries. The driving force of the system resides first in the highly organized power of the masters, and secondly, in their excellent technique.* Moreover, even little boys are somehow influenced by the public opinion of their country, and in Germany that public opinion believes intensely in education.

The weakest point of the system seems to be the very large size of the classes—35 being quite a common number in the lower and middle forms. To teach such classes foreign languages by the Direct Method is quite a feat; and it could not be possible without that excellent technique to which I have already referred. The man who can do it must have his work

* Something is also due to the provision that boys who complete six years at school are allowed to serve one year in the army instead of two.

at his fingers' ends, and know exactly what he is going to say without fumbling over a book. He must be a great economist of time; and the visitor will see at once that German boys are trained to do as much as possible for the teacher—to keep the blackboard clean, for instance. They are also trained to answer quickly and to move quickly; when a boy is asked to write something on the blackboard, he does not walk, but trips up to it on his toes, with a quick, noiseless step. Most of the questioning in class-work is general; the question is asked, the boys who know at once hold up their hands, and in some schools the boy who is ordered to reply receives no other intimation than a glance.

I may conclude this preliminary part of my report with a few words on the masters. They are all 'graduates' of German universities; if this term may be used—inaccurately—to denote one who has attended university lectures* long enough to be admitted to the qualifying examination of the German Education Department. At this examination the candidate must offer one or more recognised branches; in modern languages, for instance, he must prove his ability to teach English and French. If successful, he is appointed as a 'Probationary Candidate,' to study Pedagogics for a year, and subsequently to teach himself for a year at some high school under the eye and instruction of the masters there. During this time he is paid nothing; at the end of it he receives a report from his superiors, and if this is satisfactory, he is admitted to the Education Department. Even then he may have to wait some time for a vacancy; when it arrives he will receive (in Prussia) a salary of 2,700 marks a

* Students at German universities may come when they like and go when they like, and need not, unless they like, appear at any time for any examination. The one examination open to them is that for the Doctorate of Philology, a degree which many, perhaps most, of the students do not take. As a distinction, its value varies at different universities; from a pecuniary point of view it has no value at all. The higher departments in the State service are entered by qualifying examinations, the successful candidates are put on lists and are posted to vacancies in order of seniority.

year; with a prospect of about thirty years' service and a pension. His position in middle life is dignified and fairly comfortable, but it will be seen that it is not easily attained.

German masters as a body are penetrated with the principles recognised by the modern science of 'pedagogics.' They strive to make their work interesting and to keep their pupils active. They do not prescribe tasks but rather accompany their pupils as intellectual guides and friends. Such is definitely their aim, and in accordance with this aim long and difficult home-work is avoided —at least in all but the highest forms. If one is to criticise the system, it may perhaps be complained that it condescends too much to the average or even the stupid boy. Certainly there are pupils who have every reason to be thankful they were born in Germany. As a result of their national system they become more versatile and better informed than boys of the same endowments elsewhere.

One may add that German masters grudge no pains in the preparation of their lessons. Moreover, many of them recognise that to be a good teacher it is necessary to remember what learning is like; and therefore they do a little independent work from time to time and produce *opuscula*, which are printed in the annual school report.

### Section III.—THE PRINCIPLES OF THE DIRECT METHOD.

After the visitor has made the tour of four or five German schools, and begun to reflect on his experiences, he will probably find himself, in the first instance, perplexed by the variety of scenes he has witnessed. At one school, for instance, he finds that they use pictures; at another, they object to them: at one school they believe in phonetics; at another, they almost despise them: at one school they retain translation; at another, they have banished it; and so on. It is no easy task to disentangle what is common in their methods from what is really or apparently different.

Let us try to deal first with what is really common. It has been already said that the general object in view is a practical command of English speech, and a useful knowledge of English

literature. Men of a literary turn may also desire an æsthetic appreciation of this literature; but even from this point of view they are agreed as to the value of conversational power and practice. It is held by all reformers that this practice opens the only road to a sympathetic acquaintance with the language. For this acquaintance German has a characteristic word of its own, 'Sprachgefühl,' or 'feeling for speech.' This feeling can no doubt be acquired through the eye, (perhaps more so than some reformers recognise,) but it comes far more quickly through the ear. This will be seen merely from the practical consideration that oral repetition is more rapid, and therefore admits of more practice than written work; but there is a deeper truth involved, that speech comes naturally to the mind as a mode of expression, and is learned most easily and most completely when we feel that we have something to say and some one to say it to. This feeling, though ultimately present in written work, is present with far more force in the case of speech.

So, the first principle of the Direct Method is to use the ear in the first stages at least, more than the eye. The second principle, whether in oral or written work, is to avoid translation. In translation we have to replace one form of words by another, and here we are met by a dilemma. If we try to replace the idioms of one language by the idioms of another, then we place a tedious strain on the memory, for in each case the idioms are often irrational. If, on the other hand, we try to simplify matters, and teach the more simple and rational forms of the new language,* what we

* "He can't speak" is irrational to a Maratha child learning English, because the structure of this sentence is not apparent to him; on the other hand, "Tyala bolta yet nahi" would be irrational to an English child. "He is not able to speak" is, compared with "He can't speak," an instance of artificially-nationalised and unidiomatic language.

I have stated the argument about the difficulty of learning by translation in the form in which it is usually put by reformers. Perhaps, however, it is not so difficult to learn one form of words as the equivalent for another; but the objection remains that this process does not place the new language at our command when we are confronted, no longer with words to be translated, but things and ideas to be directly expressed.

really teach our pupils is an artificial form of the new language, which is not used by the foreigners themselves. Our pupil therefore fails to acquire, and probably never will acquire, an idiomatic knowledge of it. This above all is necessary; and the shortest way to it is by learning the idioms of the new language in connection with the facts or feelings which they express.

To all this a critic might have replied, thirty years ago, that there is not time in school to teach a foreign language by the same process as that by which a child learns his own language. It is the merit of the German schools to have proved, by careful organization, that this objection is a mistake.

The Direct Method, then, seeks to present the pupils, from the first, with facts and feelings which they can express in the foreign tongue; and beyond this, to accustom them to follow similar expression by others. At least half of conversational power consists in power to follow others, and practice in listening is therefore necessary, as far as conversation is concerned, for practical purposes. It is also advisable from every point of view, since, more than any other exercise, it compels the thoughts of the pupil to flow in the new unaccustomed channels.

## Section IV.—THE USE OF PHONETICS.

We are now almost ready to learn how conversation is started and kept going, but we have one previous question to deal with. This is the question of Phonetics.* It is clear that the Direct Method requires good pronunciation, without which its results would be imperfect at home and not much respected abroad. As to how this pronunciation is to be secured, opinions in Germany differ. Some teachers hold that correct pronunciation by the master is sufficient. Others hold that the pupils should be acquainted with the discoveries of Phonetics. Now, what Phonetics has done is this: it has distinguished the precise differences of sound between (say) German and English, and the differences in the position of the organs to which they are due. It therefore

* A Greek word: the science which deals with sounds of speech.

enables a teacher to give precise directions for the pronunciation of sounds, and some teachers believe that such directions should be given in a systematic and careful manner from the first. Others think that such directions should be reduced to a minimum. This is one disputed point in connection with the use of phonetics; the other is the use of special phonetic symbols. The occasion for these arises through the inadequacy and confusion of the English alphabet. It is agreed that the boys will distinguish the sounds better, in the beginning, if they have a few clear symbols for them. Such symbols are provided for instance by Professor Vietor in the following chart. It is not quite up to date, especially in its treatment of the vowels, but is still in use, and may serve as a specimen :—

| | Lip sounds. | Teeth sounds. | Palate sounds. Front. | Palate sounds. Back. | Throat sounds. | |
|---|---|---|---|---|---|---|
| Closed. | pB | tD | | kG | | Consonants. |
| | *m* | *n* | | ŋ | | |
| Narrow. | W fV | þ đ s Z ʃ ʒ | J | | h | |
| | | R | | | | |
| | | L | | | | |
| Open. | | | i (u)<br>e ə (o)<br>ɐ<br>æ a (ɒ) | | | Vowels. |

The letters in small type as well as þ are voiceless; those in capitals, as well as đ, ʒ, j, are voiced; those in italics, as well as ŋ, are nasal. Of the symbols þ=th, in *thin*; đ=th, in *then*; ʃ=sh, in *shall*; ʒ=z, in *azure*; j=y; for the vowels i=b*ee*t; u=r*oo*t; e=l*a*te; (o)=n*o*te; æ=th*a*t; (ɒ)=*a*ll; a=f*a*ther; while ə and ɐ stand for the sound which is heard accented in *bu*n and unaccented in oth*er*. The position of the vowels in the scheme corresponds to

the position of the tongue in pronouncing them. For i, e, and æ, which stand on the left, the tongue is raised and moved forward; in (u), (o) and (ɑ), it is lowered and moved back. For the others it occupies an intermediate position. The brackets round the vowels indicate that the lips are to be rounded. 'Open,' 'narrow,' and 'closed' refer to the state of the orifice through which the current of the breath passes; the closed sounds are those which we also call explosive, the orifice being first closed and then suddenly opened; the narrow sounds being also known as fricative, since the sound is produced by the rubbing of the air against the edges of the teeth and lips.

If, then, the teacher employs this method, his first proceeding with beginners is to show them the chart, explain to them its meaning, and practise them diligently in the production of the sounds indicated. Some teachers spend much time on this preliminary exercise. Then follows the question whether the first reading-book should or should not be printed in these characters. There are strong advocates of this course; and it is possible to obtain such books, (*e.g.*, the first part of Vietor and Dörr's Reader). It is claimed that pupils so taught pronounce exceptionally well, and can easily pass on to ordinary spelling. But this thorough-going use of phonetics is rare; most teachers who use the chart proceed at once to ordinary books (when the time comes), and teach the sounds of the words empirically, as they turn up. The chart, however, is always used for reference, where a boy fails over a particular sound. One may note that it is often used at the beginning of a lesson, for a little practice in the actual production of the sounds. Then, again, there are other teachers who will have nothing to do with phonetic symbols at all, and very little to do with phonetic explanations. They, when they come to reading, direct their pupils by the letters of the alphabet as far as possible, and trust to memory for the rest.

It is difficult to decide on the merits of these systems. But if one compares the results of Hamburg, where they don't believe in phonetics, with that of southern Germany, where they do, it is necessary to remember that in the north the native pronunciation of German resembles that of English far

more than the pronunciation of the south does; moreover, that England and English people are better known there. Thus, the teachers of the south have a more difficult problem to solve than those of the north; and perhaps one does not appreciate what they gain from their systematic phonetics. But one thing is certain, that phonetic explanations may be easily overdone; whereas the teacher's own pronunciation is of decisive importance. In fact it is quite amusing to see how closely a class will copy their teacher after a year's contact with him. The moral of this is that teachers themselves should cultivate a good enunciation and, above all, should speak slowly and clearly.* Phonetics have at any rate a use in assisting isolated teachers to this result.

### Section V.—CONVERSATION.

But we are here anticipating a little. The Direct Method does not, as a rule, begin with a reading-book. It begins with sentences, corresponding to actions on the part of the teacher. The actions are such as the opportunities of a school-room allow. The teacher (perhaps) begins by pointing to himself and saying 'I'; then he picks up a book, and says, 'take the book.' The class see what he is doing and repeat the words after him. This is the first step. I regret very much that owing to the season when I arrived in Germany—near the end of the school year—I could not witness this critical moment. But the absence of personal experience on my own part is unimportant when the whole process is so carefully described in Direktor Walter's book, *English on the Frankfort Reform-Plan*. A considerable extract is translated from this work in Appendix D; and the reader will understand from this how the early steps succeed each other. He will see that explanations in German are not absolutely barred, but minimised; and that translation, on the same principle, is only allowed occasionally, when it

* (1) It was almost always easy to distinguish teachers who had been in England, even though their visit had been a short one and had taken place some time ago; (2) everyone must have noticed in good continental hotels the aristocratic English accent of the waiters and porters, which is simply borrowed from their visitors.

offers the shortest expedient for making a meaning clear. In the course of some days or weeks, at his own discretion, the teacher begins to write these phrases on the board, choosing those which are very familiar. The characters are those in common use, and therefore not quite the same as those on the sound chart, (if that is used,) but the teacher points out their relation to these,* and the pupils gradually learn their value. Some teachers refer to them at first by their German names; and afterwards by their English names. The point to remember is that they are never told that such and such a symbol represents the German sound so and so; they are always told that it represents a certain English sound. Again, the pupils are not at this stage requested to find out from the letters what the sound of a word is; they are told that they are going to learn how a certain word is written, and the peculiarities of its orthography are introduced to them. I need not point out that a good teacher will choose and arrange his matter very carefully, so as not to waste time.

We may suppose, then, that in the course of a few weeks the class have accumulated a number of sentences, which they can more or less manipulate, and some of which at least they can write down. The time has therefore come for them to be introduced to a reader; and here the teacher has a choice of books and systems offered to him. Readers may be criticised from two points of view: their treatment of the language and that of the matter. For the present we will concern ourselves entirely with the former. We may at once, then, divide books into two classes: those that contain in themselves a treatment of grammar, and those that do not. Books of the latter class leave it to the teacher to deal with grammar as he chooses. He may teach it entirely 'out of his own head,' introducing it as he thinks proper, in connection with the reading-matter. This course is only suitable for a teacher who is at once systematic, painstaking, and adventurous. It is better for the ordinary teacher

* It must be remembered that the pupils are not very young; they have some degree of trained intelligence on their side.

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to have at any rate some guide in his proceedings; and one plan is to publish along with the reader a Teacher's Guide containing detailed instructions how to introduce the grammar. Such a guide was published by Vietor and Dörr in connection with their reader, but for some reason or other it has not found much favour with the profession. A less original plan is for the teacher to place in the hands of the class a separate grammar, and refer them to it, as occasion arises. This is actually the plan of Dubislav and Boek, whose reader (Berlin, 1903) contains 90 pages of matter and 108 pages of grammar. A third plan is to use a reader which contains a portion of grammar along with each lesson. This is done, *e.g.*, in Schwieker's Reader (Hamburg, 1900).

### Section VI.—GRAMMAR.

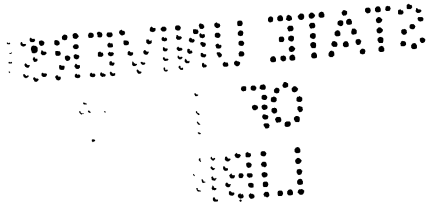
But it is time now to ask what grammar means in English and how the Direct Method deals with it. It means, of course, (i) Accidence, (ii) Syntax. Let us speak of accidence first. We all know how grammarians have dealt with accidence. They provide us with, first, rules, and, afterwards, exceptions. It has been a general plan of the past to require the pupil from the first to begin committing these rules and exceptions to memory. It generally happened that the information so accumulated was out of relation to any text that he was reading. Sometimes, indeed, he had to learn a great deal of accidence before he began to read a text at all. The theory was that when, in his text, he came across a form already learned, he would identify and understand it. In practice, however, it has been found that a store of accidence thus separately learned remains locked up in the pupil's mind, and is not available.* The Direct Method says therefore, boldly, 'Away with lists and paradigms of all sorts!' Let the pupil learn his accidence as he meets it, in the text. It is not indeed forbidden to extend the knowledge which transpires from a particular passage.

* It is related in books on Psychology that a certain man could repeat whole Acts of Parliament; but he could never say what an Act laid down on a particular point without reciting the whole of it.

Thus, if the class come across the form 'spent,' it will be pointed out to them that it comes from 'spend'; and they may be shown that 'mend' is conjugated differently. But they will not be set to get up lists of strange verbs; and above all, when a rule is pointed out to them, they will not at once be burdened with some trivial exception in the shape of a very rare word. According to this plan, the knowledge of the pupils would represent a cross-section of what other pupils might know, after the same time, who had been through systematic accidence. The latter might know, *e.g.*, all the accidence of the nouns, the pronouns, and the verbs 'to be' and 'to have'; the former would know a little bit on each of these topics and also a little bit on many others. They would complete their knowledge later on. A reader which divides the grammar into instalments of course treats the accidence in this manner, but whether the treatment in existing books is satisfactory or not, I cannot say. Schoolmasters seldom seemed to be quite satisfied with their author's methods: perhaps it is not to be expected that they should be.

Passing from accidence to syntax, the difficulties of treatment increase. The Direct Method requires that syntax, even more than accidence, should be treated inductively; *e.g.*, the pupil is not told, in the first instance, that there is such a thing as a gerund, that it is a verbal noun governing another noun, that it may be seen in the following examples, etc., etc. The process is the reverse; when two or three gerunds have occurred, the teacher brings these examples together, points out what is common to them, and finally elicits the nature of a gerund. To give the necessary explanations in English will tax anybody's skill; the difficulty is nevertheless surmounted by good teachers. They make a practice of providing the pupils, as soon as possible, with phrases and terms of explanation. Elaborate systems of parsing are not used; but the pupils understand the structure of sentences, and can point out the chief parts of them.

It should be clear from what has been said that accidence and syntax, in the system, assume their proper place, not as ends in themselves, but as means of strengthening the command over the



language. Let us now say that no means are neglected for this purpose, and at this point we may specify some of them. One is repetition. *'Repetitio mater studiorum!'* Incessantly, throughout the course of their studies, the boys are taken over familiar ground; they are asked familiar questions, to which they give familiar answers; and they repeat passages and sentences already learned. At the beginning of every lesson a few minutes are specially devoted to repetition. This is an excellent plan, as it diverts the pupils' thoughts in the easiest possible way from the subject of the preceding lesson to what follows. And in general it may be said that extreme familiarity with the old matter is recognised as a condition of progress. A second principle, to which I now refer, is the principle that new matter must be connected at once in as many ways as possible with old. This perhaps is a principle which comes into prominence rather in connection with the acquisition of words * than with the comprehension of grammar, but I introduce it here because I am now summarising the means by which the command of the language as such is confirmed. It is a principle of the memory, and it arises from the law by which we remember new matter best by throwing round it as many associations as possible. In teaching languages the Direct Method appeals to this principle as much as possible. Every name is indeed introduced to the pupils as representative of its own object or action, but it keeps its place in their memory by association with its context in the passages where it occurs, with previous passages where a similar word or idea has already occurred, or any familiar episode in the pupils' lives where it would be useful. A third means of strengthening the pupil's command of language is the practice of requiring the expression of familiar matter to be varied in form as much and as constantly as possible. But this brings us to the subject of composition, and it will be best to deal with this separately and at some length.

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* The extension of the vocabulary (Wortschatz) is a matter to which careful attention is paid (in accordance with the instructions of the Code). Direktor Walter devotes a chapter to this subject in the book already mentioned. Compare what is said elsewhere about the use of etymology in teaching English.

## Section VII.—COMPOSITION.

By composition we do not mean necessarily written composition. We mean simply the expression of thoughts in suitable idiomatic language. We have already seen that this begins as soon as the pupils begin the study of the language at all. They learn to describe their school-room, and simple actions which they see performed in it by their master. This part of their work is generally continued and developed throughout the earlier years of their course, whatever their text-book may be. They pass from their school-room to their school-buildings in general; their homes, their neighbourhood, and their town. They are taught to ask and answer innumerable questions about these. In case these topics prove inadequate, recourse is sometimes had to pictures. Ingenious pictures may be procured in Germany * representing scenes of ordinary life; and on the contents of these pictures questions may be framed. I did not, however, find these pictures in very general use; it was more the practice to base questions and answers on the contents of the reader. With a little ingenuity an endless series of such questions may be devised; and in such a way as to illustrate any new rule of grammar that turns up. Thus, the foundations are laid for more serious composition. When such composition begins, it takes at first the form of recapitulation of familiar matter. With more command over the language the boys learn to deal with matter which is less and less familiar; and they rapidly attain a power of regular composition which is quite surprising. I remember a case in which a master read out a passage from an English newspaper as an exercise for a class of boys whose average age was about 13-14, and who had been learning English nearly two years. The passage contained about thirty lines of an ordinary newspaper column; it described how a certain lawyer retired to bed and was awakened by a noise in an adjoining room, which he presently discovered to proceed from a burglar. He attacked the burglar in person, and after a struggle succeeded in mastering and handing him over to the

* The best known series are published by Hölzel and by Meinhold. A popular series is that of the Four Seasons, the illustrations of which are rather poetic in character and crowded with features.

police. This passage was only read once, and it was read rather quickly; the boys had to write down the contents of it in ten minutes. There were some failures in their results, but the best boy at any rate reproduced it quite correctly, in good writing, without any errors of spelling.* I ascertained that he had learned all his English at school, and had had no chance of hearing the language elsewhere.

Such, in general, is the way in which composition is taught. It is not usual to set the boys to write essays, as we understand them in India, though the upper classes occasionally do work of this kind. But at this point we are led to speak of written as distinct from oral composition.

Written work is taught in two ways. In the first place, the boys are required, as soon as they understand writing, to write sentences by turns on the blackboard. The sentences are at first exceedingly familiar. As time goes on, they have to write less familiar sentences, or even to put down some new expression to see what they can make of it. This process of writing on the blackboard goes on, in many classes, throughout the lesson. While the master is questioning the class he always has one or two or three boys writing something that they have heard on the blackboard. As soon as they have finished, the class are invited to read and criticise what has been written. Besides this, from time to time the boys are set to write something in their Diaries, or Day-books, which are kept for all ordinary written work. The amount of such work is relatively small; it is expected to be done neatly and carefully. It may be done at school or at home; in the latter case it will, in accordance with the usual principle, be little more than a repetition of work done at school. For instance, the boys may be set to frame questions on the matter of their reader similar to those they have heard at school. It is recognised, however, that where the exercises of the boys are all different, they will demand much attention on the part of the master to correct, and in his interest, as well as in that of the boys, they should not be made too lengthy.

* Spelling is largely taught through the constant practice of calling on boys to write sentences on the blackboard. It is taught incidentally in the case of all written composition; and often in the course of the work boys are required to spell words as they turn up. I did not hear of any special spelling lessons.

Something has now been said of the use of the text-book or reader as a means of learning the language, and of its relation to the subjects of grammar and composition. Let us revert for a moment to questions of technique. The great principle observed by a good master in the management of a class is to encourage the activity of the pupils. This is done in countless little ways. Not only does the master incessantly question the boys; he makes them question each other. For instance, he calls on one boy to ask a question of some other boy, this boy in turn, when he has replied, must frame a question of his own and put it to a third boy, and so on. Most masters never correct an error as long as there is any one in the class who can correct it. If the general attention flags, recourse is often had, especially in the lower classes, to simultaneous answering, though this is not kept up long. It is often employed to improve the pronunciation of a difficult sound. Another way of enlivening a lesson, a way not open to everybody, is by introducing a song. It has been observed that a little practice in singing notably improves the enunciation of the vowels.

If we are present at a typical lesson in one of the middle classes, we find, as I have said, that it begins with a little repetition. This may or may not be based on the preceding lesson. After this comes the examination of home work, so far as this is possible in the class, if, for instance, the pupils have had to prepare a few questions for each other's benefit. Possibly some piece of accidence has been learned and must be heard. Then follows a piece of new work. As a rule, all the text-books are closed. If the new passage is not too hard, the master reads it through twice, very slowly; and then he asks the class some questions about it. If it is too hard for this, he has the books opened and makes the class read it, and offers a few explanations. Questions are then asked, and grammar is treated inductively.*

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* One critic of the system pointed out to me that a good deal of what passes for "Inductive" treatment of language is not really such; the definition of the new word or usage is not really elicited by induction, but simply presented to the class because it is required. Still, we must note that even so it is presented, not as a part of systematic grammar, but as a piece of information required to make the text intelligible.

There may perhaps be a little written work. Perhaps there may also be dictation of an unknown passage, though I did not hear much of this.

It will be observed that translation plays no part in these proceedings. It is not, however, by any means the case that translation has disappeared from German schools. To begin with, all the more reasonable reformers allow that it may sometimes be used to fix the meaning of a word. It would be pedantic to exclude translation in every case. One master, for instance, told me that he had heard offered to a class a long explanation of the meaning of the word 'peach,' with the result that they all thought the fruit referred to was an apple. In such a case translation of the word would be held by everybody to be the right course. And several masters expressed to me their opinion that it was a useful check for the teacher, by means of which he could ascertain whether his pupils really did understand as much as they appeared to. But as far as the Direct Method has its way, translation is not regularly used as a means of learning a language. There is, however, a further question whether it should not be occasionally practised, as a distinct art, in the highest classes. One eminent reformer gave it me as his opinion that this might very well be done. I will venture to say that I agree with him. When some real command over the foreign language has been established, it is not only a fascinating but a profitable occupation to take a difficult and characteristic piece in the one language and turn it into the other. Not only does this throw incomparable light on the difference in structure between the two languages, but it is a fine training in accuracy. I may quote this as the opinion of Dr. Wendt in Hamburg, whose pupils in Ober-Prima were asked to translate a difficult passage of Locke into German, and were directed to prepare a French translation of it for the following day.* But, whether the reformers admit translation or not, at any rate they have

* Some readers of these pages may perhaps recall the name of G. W. Stevens, a writer of some reputation and still greater promise, who died at Ladysmith. I remember him saying to me that till he came to write English he never knew what he had learned from Latin prose (*i.e.*, the translation of English into Latin.)

in some cases at least to prepare their pupils to perform it. The final goal of all high schools in Germany is the Abiturienten—or Reifeprüfung—the Leaving Examination, which their pupils must pass at the end of their nine-year course, in order to secure admission to the university. At this examination in Oberrealschulen facility in translation is required; and schools which have adopted the reformed system must, at the end of their course, add this on to their pupils' attainments. It does not, however, seem to give them much trouble to do so, though the masters in such schools complain of it as an intrusion into their system.

## Section VIII.—EXAMINATIONS.

The reader, however, at this point, whether English or Indian, having heard the name of examinations, is probably curious to know what part they play in the German school system. He may be surprised when he hears that these institutions, the great glory of English (and, I believe, of French) education, are quite unknown in Germany. The pupils are promoted yearly, from class to class, without their assistance, by the decision of the masters, and only in Ober-Prima is there a formal examination at the end of the year. But even this examination does not in the least accord with English ideas of an examination. It is conducted by the Schulrat, or Chief Educational Officer of the district, in consultation with the Direktor and the teachers of the Ober-Prima. It is partly oral and partly written, but in no case are there any printed papers. For the purpose of the written examination the Schulrat may set questions himself; or, as more frequently he does, he may choose questions out of a list submitted to him by the head-master. If he is well satisfied with a boy's written work, and with his master's account of him, he may excuse him the oral examination. But even taking both into consideration, the candidates' fate does not altogether depend on his performances, for his record during the past year must also be weighed, if the masters consider that he has not done himself justice. One may add that when the masters submit to the Schulrat a list of the boys about to appear for the

examination, they point out any of them who, in their opinion, are not duly prepared for it. The Schulrat may, if he chooses, decline to examine such boys. It is clear that German school-masters to a great extent control the destinies of their pupils; and as far as their methods go, they cannot complain that they are fettered by examinations. Government does indeed prescribe a standard for each class; and when the school is inspected, perhaps once in two years, I suppose care is taken to see that the classes are up to their proper standards. But I gather that as long as men are working honestly they have ample freedom in their methods.*

The Prussian 'Lehr-plan' or Code is printed in Appendix A of this report. Careful examination of it will reveal the fact that it is to some extent a compromise between the old system, under which translation and grammar were prominent, and the new Direct Method. As such, it does not satisfy everyone; but in practice, as I have said, the system of control is elastic. The only grievance of the reformers is that they must offer translation in the Ober-Prima.

### Section IX.—GENERAL VIEW OF THE LINGUISTIC RESULTS.

We have now concluded our view of the Direct Method from the purely linguistic standpoint. It remains to consider the matter which is selected for its purposes, in readers or text-books, throughout the school-course. But before we proceed to this the present is

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* Is there any 'cramming' in German schools? It must be remembered that 'cramming' is a popular term, and therefore on analysis we need not be surprised to find it covers different and remote meanings. 'Cramming,' as an evil of English school-life, means getting up an unhealthy amount of information in order to produce it at an examination and throw it away afterwards. As examinations are not a conspicuous feature of German school-life, cramming for them does not exist, except perhaps a little in preparation for the Reifeprüfung. But, as I suspect, essentially the same evil does exist if we contemplate German school-life as a whole. The curricula are too large for many of the boys; and it seems probable that when they leave school their minds (consciously or unconsciously) in self-defence, as it were, consign much of their information to oblivion. Here we have cramming, though not in connection with examinations: the chief source of it in Germany is the system by which each master has a separate subject, and grinds it remorselessly into each class, as though it were the whole end of their education. But at least it may be said that this cramming is the penalty of ideals, and is not born of a desire to advertise schools (as in England), or to make money (as in India).

an opportune moment to try to sum up its achievements. In making this attempt, as the reader perceives, I rely on my own impressions, just as they were gathered during my tour in Germany. I am very well aware how imperfect they are. But, at any rate, as far as my actual opportunities went, I had the chance to see as much as was possible in the time. In every school that I visited the masters showed the most obliging kindness; it is quite certain that they never attempted to conceal any weakness in their system. It generally happened that after calling on the head-master I was taken straight away to a class-room and found the ordinary lesson of the day proceeding. The only difference that my presence made was that very often there was more repetition of old work than would otherwise have been done. I was generally invited and always readily permitted to question the boys myself, and in such cases it often happened that I was the first Englishman whom they had ever heard. On the other hand, the reverse was sometimes the case; twice, when I was astonished at the English of the best boy in the class, I discovered that appearances were deceptive; one of the boys came from a family where there was an English governess, and one from an English-speaking colony abroad. But these were exceptions.

I may say in general that I was exceedingly well satisfied with the power of the boys to understand what they heard. Of course this power was not entirely due to their linguistic training; it was due to the general character of their education. This is such as to make the boys very versatile; they see at once what is wanted of them, and they have a great power of applying their information to any topic that is brought up. I always found that the boys entered quickly into the spirit of the subject on which I chose to talk to them. At one school a class in their second year of English instruction were reading a passage about mines, in which it was stated that gold is smelted out of the ore in furnaces. I took the opportunity to describe the very different process by which it is extracted at the Kolar mines, and found the class understood me readily. Of course in speaking to the younger boys I did not neglect to speak slowly

and distinctly; it will be remembered that I was a complete stranger and perhaps the first foreigner they had ever heard. With regard to the boys in the Ober-Prima I believe they were quite ready to follow lectures—in the university sense—on difficult or abstract subjects. At one school a rather amusing illustration of this occurred. The Director was present, and the English lesson had been prolonged beyond its own limits into the Physics hour. The Physics master accordingly appeared on the scene. Now, he had been many years in America, and spoke English fluently, but of course he taught Physics at the school in German. The Director suggested that he should question the boys in this subject in English; and he did so, asking them for descriptions of the various forms of crystals. They answered these questions very readily and accurately. But the only person surprised at the result was the Physics master himself, who had never heard the boys speak English, and discovered for the first time that he might, if he chose, teach them in that language. In English the same class had read *Enoch Arden*, and they answered readily my questions,* which were quite searching, on the matter of the poem. They were able to follow a short poem of Longfellow's which they had not heard before. It was not a very difficult poem; but to follow poetry in a foreign language is quite a final test of the power of oral comprehension. I have already referred to the Ober-Prima at Hamburg who had read (in an abridged form) Locke's Essay; they were quite able to answer questions on the matter of it, and I believe could have followed a critical lecture on it, if reasonable care had been taken to simplify the language.

In power of expression the boys, as I heard them, were not always relatively so good as in the power of comprehension. But much allowance must be made (more in the case of elder than of younger boys) for a little confusion when exposed to the united criticism of the class, their master, and an unknown stranger. Making this allowance the Direct Method certainly attains its objects. It must

* *e.g.*, Illustrate from the poem Tennyson's power of dealing with domestic scenes; with types of vulgar people; of describing commonplace objects in lofty language.

be remembered that the boys who spoke to me generally had to travel outside the range of the topics familiar to them, *e.g.*, I often invited the class to put some questions to me regarding Indian boys. After a short pause such questions were usually forthcoming, *e.g.*, "What clothes do Indian boys wear?" (Very likely with a junior class in the confusion of the moment, this question might appear in its Germanised form as "What clothes wear the Indian boys?") To this I might probably reply that they wear a long piece of cloth without any buttons or button-holes; and ask "How do you think it is put on?" Some one would then be pretty sure to answer, "They turn it round themselves," or something of the sort. This, for boys in their second year of learning English, is quite a creditable achievement. Of course where they were dealing with familiar ground they had a ready flow of words. One might find many boys in the Ober-Prima of German schools who could recite a whole history of England in accurate English.

Regarding pronunciation, results varied. The one point quite clear to me was that a really finished pronunciation was only achieved by masters who had visited England, and boys who had listened to such masters. This is natural. The individual sounds of a language may be specified by phonetics and even attained by the isolated student; but the general character of a language must be mastered by imitation. Where masters and boys had had anything like a fair opportunity the results were very good. They were indeed so good that one feels the German authorities would find it worthwhile to make them universal, by extending facilities for teachers to visit England. It is surprising how much is effected by even a short visit to a foreign country; and that of course not only in pronunciation, but in appreciation of the country, if the visit is wisely used. This, however, is a matter to be spoken of later on.

### Section X.—DEFECTS OF THE DIRECT METHOD.

So much has now been said of the merits of the Direct System that the reader is probably impatient to hear something of its demerits. He surmises no doubt that these exist, since they exist in the case of every system. We may speak then shortly of them.

In the first place, taking the system at its best, there are things which it does not do. We have seen that it objects to the old system of linguistic training, because that system provides the pupil, in the name of grammar, with general rules, and then expects him to apply these rules. This is an unnatural process of the mind; and the pupil fails for a long time to carry it out. He is constantly making mistakes because he fails to recognise that a certain rule which he has learned is applicable to a particular instance. To avoid these mistakes he has to accustom himself to great caution; he has to keep it in his mind as a pre-supposition that he does know the rule, if only he has the patience to find it out. The information is, as I have said elsewhere, locked up, but it is his business to unlock it; that is exactly his problem; and it is only by examining with precise care the work he has to do that he will find out what rule applies.* Now, it may very well be maintained that this process, on the whole, is the process most important for us in the affairs of life. Certainly in responsible positions, the power of applying it is a qualification of supreme value. If we ask what it is that distinguishes an able man, we shall find that it is largely the powers of seeing what general principles apply, and how they apply, to particular cases. This power, so far as it is a matter of training, is developed by habitual caution and precise examination of the matter in hand. And it cannot be denied that these were the habits induced by a thorough-going education in grammar and translation, of the old-fashioned kind. This, it appears to me, is what a past generation of Englishmen really gained from the old public school education. No doubt, they often failed to gain it in as high a degree as they might have done, since the public schools were seldom conscious of their own principles, and often badly managed. But these facts should not be allowed to obscure the argument.

If we look at the results of the grammar and translation system in the way of command over language, they were generally *nil*. But one should not say they were always so. The gifted boys, and those who persevered to the end, did at last come to a first rate power of reading (say) Latin and Greek and making finished

* All this may be very well illustrated from the process of translating from English into Latin, which formed so large a part of the old English education.

translations into those tongues. And one need not doubt that they could easily have added conversational power to these attainments.* Certainly, however, the old method must not be judged by the degree of linguistic skill it imparts to the average boy. It is, then, equally true that the new method must not be judged by the intellectual training it imparts? The advocates of the new method would strenuously deny this; they claim that in point of training their system is equal to the other. But here I cannot follow them. One must be careful to put the criticisms on the right ground. One must not object to the Direct Method because it is too easy. Let anyone try it for himself, in a language which is not familiar to him, and he will soon perceive that he has to exert himself. It is true that some defenders of the method have claimed that it is easy; but it seems to me they have confused what is easy with what is attractive. The method is attractive because it is interesting, and the pupil feels he is making progress; but it is not easy, if by easy is meant practicable, without energy and concentration. Nor does it fail to afford some practice in analysis; for instance, in comprehending the difference between the different tenses there is scope for the exercise of analytical power. That very power of applying rules which I have noted is also called sometimes into play. But it is emphatically true that the method, in its most scientific form, throws these things into the background. It trusts, as far as possible, to instinctive reproduction of the forms of language. I cannot discover that it habitually evokes any process of the mind except intelligent imitation. Of course it does in general stimulate intelligence, especially because of the matter treated, as we shall see later on; but it cannot be said that any single principle is so burned into the minds of its pupils as the principle of the old classical education, which taught a man always to reflect, to look for the rule by which his conduct should be guided. I feel bound to dwell on this point because the old classical system does not receive enough justice to-day. When once we apply the wrong criterion to it, it looks contemptible enough. But, then, we are face to face with the fact, admitted by everybody, that the educated classes of England during the last hundred years have

* I met one head-master in Germany, evidently of the old-fashioned race, who spoke Latin gracefully and fluently.

contained quite a satisfactory proportion of accomplished and penetrating men; men of the world in fact in the best sense of that expression. When one looks at the system of their education, it seems at first sight to include nothing that accounts for this; and some people have maintained that they succeeded in spite of their education. This also has occasionally been true but exceptionally. The true explanation, I believe, is to be sought in the direction I have indicated, or partly at least; the subject cannot be continued further in the present report.

A practical criticism of the Direct Method is that it is very difficult to find men to work it. It is dangerous alike for enthusiastic and for perfunctory teachers. The enthusiastic teacher is apt to be erratic. Though he knows that thorough system and constant repetition are of the very essence of his method, yet he is apt to introduce interesting things as they occur to him and forget that he has introduced them afterwards. In the old system the teacher had landmarks at every turn and point to guide him. Here he has to set them up for himself. He cannot dispense with elaborate preparation of his lessons and exact notes of what he has done. The perfunctory teacher will never achieve much under any system; but least of all if he has to take in hand the Direct Method. This method is (quite properly) more tolerant of errors and misapprehensions in its early stages than its more sober rival. It means to fly where the other creeps. But this makes it much less suitable for the unambitious teacher. It will give him a better chance to conceal or excuse failures which he might have prevented.

Of course it may be said there ought to be no such things as perfunctory teachers. Certainly, in Germany at the present day there are few of them. But, then, Germany exists at present in a stage of expansive vitality. Nobody, not all the historians, can account for this phenomenon; we cannot say why nations make a sudden move, any more than we can say why men of genius are unexpectedly born. We must accept with gratitude the fact of such expansion, if it happens to come in our own time and our own country. And even in Germany, if there are not many perfunctory teachers, I gather that there are some who are not inclined to face a system so trying as that of the Direct Method.

## Section XI.—THE GOUIN METHOD.

Before proceeding to discuss the matter contained in German readers, I will devote a little space to a separate treatment of the Gouin system. This system is not much followed in Germany, but there are schools which have adopted it, and I visited such a school in Hamburg. It was a Volksschule, a primary school, attended chiefly by boys of the artizan class. It was taught by Herr Direktor Höft, who has also published a reader in accordance with the principles of the method. Through this gentleman I was introduced to Herr Pechner, the proprietor of a large girls' school in Hamburg, where also I heard some lessons given according to the system.

I cannot do more than refer to the life of François Gouin, which was full of curious vicissitudes. He was born in 1831, and his book, *L'Art d'Enseigner et d'Etudier les Langues*, was written about 1870. It is now available in English, under the title "The Art of Teaching and Studying Languages." Whatever may be thought of the merits of Gouin's system, there can be no doubt that on its own subject his book is one of the most luminous and suggestive ever written. Though the system is not wholly unknown in India, it is so little known that I will give a summary of its principles.

These will be approached most easily by presenting to ourselves the first page of a book constructed in accordance with them. I take, therefore, the first page of Herr Höft's book.

*I.—I write on the blackboard.*

| | | |
|---|---|---|
| Rise. | I rise from my place. | Rise-s. |
| Go up. | I go up to the blackboard. | Go-es. |
| Put out. | I put out my hand. | Put-s. |
| Take up. | I take up a piece of chalk. | Take-s. |
| Write. | I write on the blackboard. | Write-s. |
| Read. | I read the writing. | Read-s. |
| Rub out. | I rub out the writing. | Rub-s. |
| Clean. | I clean the blackboard. | Clean-s. |
| Go back. | I go back to my place. | Go-es. |

The way in which this material is used is as follows :—*

The teacher first explains in German that he is going to describe the actions involved in writing on the blackboard. He names each of these actions in German, and requests the pupils to recall them in their minds. He then abandons German, and names each action in English. The pupils repeat each sentence after him ; and subsequently each sentence is written on the blackboard.

The principles involved in this proceeding are as follows :—

i. When we begin to learn a language we should confine ourselves to matter which is absolutely familiar.

ii. We should accustom ourselves to rely on mental images rather than actual objects. For beginners only some assistance from objects and gestures may be permitted.

iii. The matter should be presented as a process ; the mind is fond of following processes, and by taking advantage of this images and words will be induced to suggest each other.

iv. The language should be assimilated in sentences. The verb, however, is the decisive part of the sentence, and command over language means, more than anything else, power to manipulate verbs Therefore, from the first, the pupils should accustom themselves to manipulate the verbs.

This, however, is not all. We have so far been dealing with objective language, the language of description. But half of men's language is subjective—it expresses their feelings and desires. We must direct the attention of our pupils to this distinction and provide them from the beginning with an equipment of phrases suitable for this purpose. This Herr Höft does, in connection with each lesson, under the title of 'Conversation.' Here is the 'Conversation' provided for the First Lesson :—

Pay attention.
Speak, if you please.
I am listening.

* Some of the details must be left to the reader's imagination, especially the extent to which explanations are given in German.

Are you listening?
Good; it is very good. It is not good.
Is it right? Yes, it is quite right. It is not right.
He speaks very well.
You speak very well.

Grammar is also provided in connection with each lesson. It consists in the beginning chiefly of simple directions for conjugating the verbs. The whole book contains 118 pages of lessons; the abstract of grammar at the end contains 25 pages, the most interesting part of which is the treatment of tenses. The lessons are not all descriptive of actions; the pupil soon proceeds to simple tales, which are printed at first on the same plan as the first lesson reproduced above, with the verbs in conspicuous type at the side. When the pupil has passed through a first book of this kind he is in a position to go on to a reader, and from this point the peculiarities of the Gouin method become less marked.

Now, as to the success of the method in imparting command over a language, there can be no doubt whatever that success is simply astonishing. It is certain, I believe, that Gouin's method, conscientiously followed, affords incomparably the most rapid introduction to a new language. And its claims to be considered 'scund' appear to me quite equal to those of other Direct Methods. On contemplating its results one's first feeling is that it deserves to supersede all these, as its supporters say. Further reflection, however, discovers some arguments against it. In the first place it is not accompanied by any march of information at least during the first year. To this it may be replied that the information is sacrificed for a good reason, and not much is lost. Besides, under the old system boys used to learn Greek and Latin and French and German, for years together, without acquiring any information, except that "Balbus was building a wall." Nobody complained of this; why, then, should people complain of the same feature continued for a much shorter time in the Gouin method? The actual amount of information gained during a year of other methods is not so large but what the Gouin pupils will easily make it up afterwards. But, it may be said, without a flow of such

information the work will be dull. That, it may be replied, depends on the teacher. But the reply brings us to a third criticism of Gouin's method, which, to my mind, has much more force in it. The system does demand something from the teacher, and yet it provides him with very little stimulus. It has the appearance in fact of effacing him. Some of its advocates indeed make this into one of its merits. Even a bad teacher, they say, cannot go far wrong with it. He will find it lays down for him exactly what he has to do, so that results, if not the most brilliant results, are assured in any case. Considering, however, what human nature is like, we may say that if the Gouin system were imposed on schools at large, most teachers would be tempted to subside to a commonplace level of efficiency. What the system demands from them, if they wish to rise above this level, is something very difficult to ensure. It demands that they shall maintain a lively demeanour while following a perfectly precise and rigid routine. It minimises their scope for originality, and seems to promise that, whatever they achieve, the credit will all go to the system. This, at least, is what many teachers seem to feel; and this is probably the objection which prevents the system from making progress. On the other hand, there are some quite original teachers who do not dislike it; and for the purpose of teaching adults, where their objections do not apply, it has been widely employed.

## Section XII.—CONTENTS OF READERS IN USE.

Let us return now to the readers in use in German schools and examine them from the point of view of matter. We shall find represented in them a great variety of aims and methods.

We may begin with those readers which are designed for the lower and middle classes in the English course; and we may ascertain what they are like from specimens of representative and popular books.

*Lehr-und Lesebuch der englischen Sprache nach der direkten Methode.* (An English Instruction and Reading Book after the Direct Method.) By A. Schwieker. Eighth edition. Hamburg, 1900.

From a linguistic point of view this must be classified as a modern book. It is intended that the pupils shall begin to read it very soon, and it contains a little grammar along with each lesson, also specimens of questions on the lesson. But in other ways it is almost old-fashioned; and the fact that it reached an eighth edition in 1900 is a proof that the reformers have not yet converted the whole of Germany. There are no phonetics provided; and no pictures with the lessons (except some coins). The first lesson is "The Family"; it contains three sentences, of which the first is "I have a father and a mother. My parents have two sons and three daughters." The following list will show how it goes on:—

2. My family, (*continued*).
3. A dialogue:—What is your name, my boy? My name is Richard Scott. Are you our neighbour's son? etc., etc.

A rhyme:—

One, two, three, four, five,
I caught a hare alive;
Six, seven, eight, nine, ten,
I let it go again.

My little brother.

Shake your rattle, here it is,
Listen to its merry noise;
And when you are tired of this,
I will bring you other toys.

4. The school-room.
5. Our house.

* * * *

41. English money, measures, weights, with metrical exercises.
42. Clothes.
43. A letter of invitation. Queen Victoria. God save the Queen.
62. Application for a situation. Request to a friend in London concerning lodgings.
63. Commercial letters and advertisements.

After 64 lessons the book proceeds to connected extracts. 'George Washington' begins the list; it is mostly made up of fables. One piece is devoted to 'England,' but it is very short and tame. A short appendix gives eight little English songs, with musical notes. Another appendix gives eight pictures, with descriptions of their contents. We should also observe the list of (English) "Commands and expressions made use of in Teaching."

Now, this is by no means an unpractical book, yet in two respects at least it does not satisfy the requirements of the reformers. First, its contents are not distinctly English; in 159 pages of matter (and grammar) there are not half a dozen altogether that place the learner in an English environment. The pictures at the end are characteristically German.

It may be asked why itis desired that the contents of an English reader should be distinctively English. Such a character, it may be pointed out, conflicts with one of Gouin's principles, according to which the matter that is handled in the first stages should be absolutely familiar. Is that principle not correct? It is so, I think, from the point of view of linguistic progress. Some teachers indeed assert that the matter traversed by the Gouin method is uninteresting; and therefore the application of the boys is not sustained by it; and they would apply the same objection to most of the matter in Schwieker's Reader. Let the matter, they say, be novel; the interest aroused will then lead to more linguistic progress than that achieved by more scientific but duller methods. It is difficult to gauge the value of this argument; one gets such very different accounts from different schools of what boys find interesting. I am inclined to think that, as far as school-boys are concerned, all educational theorists are inclined to weigh too curiously the merits of school-subjects from the point of view of interest. The considerations which make subjects interesting to men are not accessible to boys: they arise from broad views of what is elevated or useful. If we make boys prematurely familiar with these considerations, we leave them no further discoveries for a riper age, and our pupils end in a stage of shallow and arrested development; it is perhaps fortunate that the minds of average boys are obstinately impervious to 'higher motives.' But, relinquishing these reflections, it may be

said that, as far as interest is concerned, what sustains interest from day to day and hour to hour throughout the school-year is the manner and method of the teacher. It is desirable therefore that programmes of school-work should be weighed, on the ground of interest, primarily from his point of view; it is desirable that he should have a programme which conduces to an interesting method on his part. Herein it will be found that different men prefer different programmes. A really first-rate teacher will perhaps prefer a programme and a book which are superficially dull and bald. His reason lies precisely in the opportunities of making himself the sun of the system; he will throw the book into the background and make himself the source of interest for the class. A moderate teacher will prefer a bookwhich provides more of the interest in itself; though he ought not to forget that if he is dull the boys will find the book dull too. The real merit of the book will be in this case that it stimulates the teacher. Returning to our immediate question as regards the matter of English readers, I am inclined to think the argument from interest does point in the direction alleged by t he reformers, *i.e.*, that English readers should contain English matter. But I do not think so on the ground that it is natural for German boys to want to know a good deal about England; nor do I think it as easy, as some enthusiasts suppose, for them to *realise* what they are told about England. But I believe that on the whole the treatment of English Realien * is stimulating to the teacher, especially if he has seen England, and therefore in a secondary way it conduces to an interested attitude on the part of the boys. It is impossible, however, to dwell too much on the fact that everything depends on the teacher. If he is dull, then the boys will assuredly find their work dull if they have to read a lot of facts about a country which they have not seen.

Still, the argument for the introduction of Realien into the English reader does not end here. We may look, in a commonplace manner, at the general objects of modern education in Germany, which expressly include a thorough knowledge of English life and character. It is clear that this knowledge may be conveniently

*A convenient German word. A plural noun for the observed facts of a nation's life.

imparted in English lessons, from the first, whether it makes the early lessons more interesting or not. That might even be desirable if some progress in language were sacrificed for it, as a disciple of Gouin would probably allege. But when we leave the rudimentary stages, it admits of no dispute that a study of the language and the people should go hand in hand. We need not even wait for the period when regular classics can be attacked. As soon as connected passages are read, it begins to be clear how much light matter and language cast on each other. The pupil not only understands better what he is doing as he goes along, but he forms unconsciously all those associations which lay the foundation of a complete insight into the foreign nation. We may say, then, that a book like Schwieker's, in spite of many advantages of arrangement, remains incomplete from the point of view of the Direct Method.

It has also another defect: it does not quite avoid old-fashioned English. This is a point on which reformers lay great stress. Our pupils, they say, must begin by learning, and first learn thoroughly, modern English. This is necessary from a practical point of view; and it is also necessary to keep the pupils in touch with modern life. Later on, when they can recognise the difference, they may be introduced to older English. But it is all important not to do this prematurely. Consequently they would object to the introduction in a first book, of a letter of Lady Mary Wortley Montague, in which it is said that "Leipzig is the resort of all the people of quality."

We may now examine two readers which satisfy more completely the requirements of the modern method. One is *Englisches Lese und Realien-Buch*,* by J. Klapperich; published by Velhasen and Klasing. This is purely a reader. It is divided into five parts, and contains 307 pages. The following is a synopsis of the contents:—

I. GREAT BRITAIN AND IRELAND.

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* 'Realien-Buch' is a phrase which cannot be directly translated into English; it means 'a book containing an account of English life.' 'Lesebuch' means Reading book.

A. Scenery and Industries. Many of the extracts deal with great towns; they are usually provided with suggestive titles, *e.g.*, "This precious stone set in the silver sea": "London, the Mother of Cities."

B. Life, Customs, and Institutions. School Life; Rural Life; the British Government.

C. Pictures from English History.

II. GREATER BRITAIN. The Colonies; India.

III. AMERICA.

IV. SELECT POETRY. The earlier pieces include: Rule Britannia; Ye Mariners of England; The Miller of the Dee; Lucy Gray; The Battle of Blenheim; The Slave's Dream. The selection concludes with Mark Antony's Speech.

V. LANGUAGE AND LITERATURE. A historical account.

This book is not intended for the first steps of beginners; nor is it suitable for those who begin English very young. But it must always be remembered that in most German schools the boys do not begin English very young; and according to some systems they do not begin till they have already experienced the process of learning a foreign language, in the case of French. In reflecting on their method or their books the reader should always keep in mind this point; and should make certain that he has thoroughly grasped the information, already laid before him, concerning the curricula and the average age of the classes.

The prevailing style of Klapperich's book is simple modern literary English. It is very well illustrated. As it does not include a treatment of grammar, it would be necessary for the class to possess a separate grammar; and I may mention here the name of one; *Englische Schul-Grammatik*, by B. Röttgers; published by Velhasen and Klasing, 1905. I have no space to examine it in detail, but may say that it includes thirty-six pages on sounds.

To further illustrate this type of 'Realien-Buch,' I prefer to take a French work. The French nation (like the English) have lately woken up to the necessity of reforming their methods

of teaching languages; and they have begun by producing some excellent books. That which I am now going to mention is an exceedingly conscientious and scientific piece of work. It is called *An English Reader with Conversation and Exercises*, by Schweitzer and Vincent; published by Armand Colin, Paris, 1904.* It is published in four volumes, and contains sufficient matter for six or seven years' work. The volumes are named after the classes in which they are intended to be used.

### Vol. I. Sixth Class.

*First Part.* First lesson: Names of objects. The floor. The wall. The window. The door. The ceiling. The school-room.

Sentences. This is the floor. What is this?

Fourth lesson: place of objects. The floor is under the feet.

Sixth lesson: things belonging to the boy or girl.

Twelfth lesson: the material of which things are made.

*Second Part.* Actions in the school-room.

A few connected pieces follow. In lesson 75 comes 'Little Red Riding Hood' (a nursery tale).

Throughout this volume there is an instalment of grammar with each lesson, as also in the second volume; but not in the third or fourth, as the treatment of this subject is completed. We may note that all through Vol. I accentual marks are supplied with the words—an assistance particularly necessary for French boys.

Coloured pictures are bound in at the end of the book; very good in themselves, but quite French in their character—a fact which I cannot understand.

### Vol. II. Fifth Class.

Resuming work at school; The town; Means of locomotion; The village; Saints' days; Winter pastimes; Government.

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* It will be observed that this book has been produced by a Frenchman and an Englishman working in concert. This is probably the best plan: it has not yet been adopted (so far as I know) in the case of any German book. I understand, however, that Professor Morsbach of Göttingen and his colleague, Mr. Tamson, are at work on an English reader, which will shortly appear.

A sort of abstract of the pieces is provided in a series of sentences, after the Gouin method; so that the teacher can to some extent employ this method if he feels so disposed. It will often be found that books are influenced by Gouin's ideas, even when they do not adopt his system entirely. Especially, recent books introduce passages in which a process is followed step by step.

### Vol. III. Fourth and Third Classes.

Descriptions of the school-life; of the agricultural and manufacturing districts of England; Ports; Commerce; Scotland; Ireland; the British Empire.

A small chapter on English traits, in which Emerson, Lytton, and Washington Irving are drawn upon. The compilers evidently wished to rely on classical writers for this important part of their matter. But they were met by the difficulty that classical writers who have described the English character are extremely few in number; and their work is quite unsuitable for the purposes of a school-book, both in style and matter. This is especially true of that tedious and affected and wholly third-rate author, Washington Irving, who is much read in German schools, apparently for no other reason than this, that he affords a sort of external view of the English character. I believe myself that a view of the national character ought to be included in any book of Realien, whether it deals with the English, French, German, or any other nation. It ought, however, to be specially written by an author of the nation represented, with the presupposition, candidly avowed, that he writes as an enlightened patriot. I think this would be better than to choose an external point of view, which is difficult to attain and quite as likely to be misleading as the other. Moreover, for the purposes of school-boys, it is essential that such an estimate should be framed from a contemporary point of view and written in a contemporary style. Escott's *England* for instance, (published by R. Gaertner, Berlin, 2nd edition, 1898) though conscientious is obsolete and misleading.*

*If it be not thought egoistic to mention a book of one's own in a report, I may refer the reader to my own '*England*;' (Madras Christian Literature Society).

I defer the examination of the fourth volume of the series till a little later. It will be observed that there is not much poetry in the first three volumes; also that English Realien do not begin very early. In accuracy of style and methodical arrangement of the contents this series seems to leave little to be desired.

*The English Student.* By Dr. E. Hausknecht (7th edition, Wiegandt and Grieben, Berlin, 1903). We take up here a much more original work. It has not even a German title, and it proceeds at once to plunge the German school-boy into English surroundings. It opens with—

SKETCH I.

*First Dialogue.*

Getting up. In a bedroom of Charterhouse School at Godalming, Surrey.

*Tim* (pulling the blanket and counterpane off Bob's bed).—Hulloa, Bob, get up. Doesn't Parker ring the bell loud enough?

*Bob* (waking and rubbing his eyes).—What! six o'clock already? I still feel very sleepy.

*Tim.*—That's how it is every morning. Make haste to get dressed. It's twenty minutes past. Have you forgotten what the doctor said last week? And so on.

The second dialogue takes place between the boys in school; the fourth in the dining-hall; the fifth in the play-ground. Subsequently the boys visit London with a master; they go to Portsmouth and see the ships. After thirteen dialogues, Compositions (connected pieces) follow. The subjects dealt with are: The Royal Banquet at Windsor Castle; Brooklyn Bridge (America); Leichardt (Australia); The Old Britons; The Coming of Christianity; and these are followed by various historical pieces, ending with the visit of the Prince of Wales to India. These pieces occupy fifty pages. Thirty pages of poetry are added, varying in difficulty from the very simplest to Shakespeare and Paradise Lost; (it appears to me that this very difficult poetry is really outside the scope of the book.) A further supplement of fifty pages

gives a number of topics suitable for general conversational purposes—mostly drawn from the actual surroundings of the boys, but partly geographical. At the end of the book follow specimens of advertisements and other general data.

We are at present criticising books from the point of matter, but I may digress for a moment to speak of the very complete treatment of method in this book. Phonetics are not unrepresented, though not treated very fully; there are a few introductory pages where the English and the phonetic spelling are displayed side by side; and phonetic equivalents are provided for every word in the vocabulary. There is an instalment of grammar with each dialogue; for further progress there are seventy pages of systematic grammar. A complete apparatus is provided to guide the teacher in that process of questioning and manipulating the language which, as we have seen, forms an essential part of the Direct Method. Specimens of questions and answers, such as the teacher should require, are printed along with the early dialogues. The matter of these dialogues is also presented in the form of short connected pieces; there are exercises consisting of sentences which the boys are required to remodel. In connection with the compositions there are lists of kindred and connected words. Dr. Hausknecht's book is in fact the most complete guide to the New Method that I have seen; it contains nearly five hundred pages, and may be compared to a complete Army Corps, with Infantry, Cavalry, Artillery, Sappers and Miners, Supply, Transport and Medical Departments; and perhaps the existence of such a work leaves me no room to complain, as I have previously done, that the New Method does not supply the teacher with landmarks. Taking the book on its own ground the only criticism I can make against it is that the pictures are not quite worthy of the matter.

The reader may now suppose that all types of readers have been exhausted; but this is not the case. There exists another book quite different from Dr. Hausknecht's—quite different from it, but equally the fruit of conscientious and sympathetic toil. This is *Vietor and Dörr's English Reader* (published by B. G.

Trübner, 7th edition, 1904). I prefer to describe it not in its present form, but in a new edition shortly to appear, which is better adopted for boys. The possibility of doing so I owe to the kindness of Direktor Dörr, who showed me the proof-sheets.

This work, quite unlike that of Dr. Hausknecht, is simply a reader. It contains no methodical grammar, since the original idea was that these should be treated in separate works. The authors believe in a careful phonetic preparation; and the early portion of their reader will be available in a phonetic transcription. Directions for the introduction of grammar were published separately to accompany the earlier form of the book; but these, as I have mentioned elsewhere, have not been much employed by teachers.

*Part I.*—Contains many nursery rhymes, and bits of nursery lore, *e.g.*, "This is the House that Jack built," etc. There are also pieces of simple poetry: "What does little Birdie say?" (Tennyson). One or two family conversations:—

*E.*—Who's that at the door?

*T.*—It's mamma.

*Mamma.*—I am afraid you boys will be late for breakfast if you don't make haste.

*T.*—O mamma, I was so sleepy this morning that I couldn't wake up. &c. &c. &c.

There are descriptive pieces (The Nursery); and pieces on the Gouin plan:—

I go to the door.
I stop at the door.
I stretch out my hand. &c. &c.

In the concluding pieces the seasons are described: "In winter there are no leaves on the trees. The ground is often covered with snow and frost; and there are showers of rain and sleet. When the ponds and lakes are frozen, then is the time to slide and skate on the ice," etc.

There are fifty-nine pages in this part.

*Part II.*—A fable. A comic poem on the Parts of Speech (taken from *Children's Talk*, by R. Shindler). Description of a

game of cricket. Farms, Gardens, and Fields. The family go into the country—on the Gouin plan.

"In the summer the father takes an old-fashioned cottage in the country or takes a room in a farm.

"The family pack up their luggage, drive to the station in a cab," etc., etc.

Other fables follow; a tale called 'The Black Brothers,' beginning, "In a secluded and mountainous part of a far-off country, there was, in old time, a valley of the most surprising and luxuriant fertility." 'The Brook.' (Tennyson).

*Part III.*—Pieces on home-life, with corresponding poems:—"Home they brought her Warrior dead" (Tennyson); "The Old House by the Lindens" (Longfellow); "The Graves of a Household" (Hemans).

*Part IV.*—England and the English. Here we have a few pieces on 'Realien;' descriptions of London; of a country town; of the commercial and industrial life of England. There are stories of heroism in war and peace. 'Grace Darling,' for instance, finds a place. Amongst the poetry we may note: "Rule Britannia"; "A wet Sheet and a flowing Sea" (Dibdin); "The Three Fishers" (Kingsley); "Ye Mariners of England"; "The Burial of Sir John Moore"; "The Charge of the Light Brigade."

Moral and Religious Life. Extracts from the New Testament are given. Amongst the poetry are: "I remember, I remember" (Hood); "The old Clock on the Stairs" (Longfellow); "The Better Land" (Hemans).

*Part V.*—The Seasons; illustrated by passages from Mrs. Gaskell, J. K. Jerome, and G. Gissing:—"It is Sunday morning, and above earth's beauty shines the purest, softest sky this summer has yet gladdened us withal. My window is thrown open. I see the sunny gleam upon garden leaves and flowers. I hear the birds whose wont it is to sing to me," etc. The last poem in the book is "The Death of the Old Year" (Tennyson).

From this it will be plain that Vietor and Dörr's book sets before itself quite a different object from that of its rivals. It does not trouble itself much with the Realien, the external facts

of English life. It seeks to reproduce the inner atmosphere of the best English minds, and with this end in view it tries to make the German boy live through the life of the English boy who is so fortunate as to grow up under pure and happy influences. It begins in the nursery; and this gives the impression, when first one opens the book, that it is too childish for schoolboys. This impression, however, is seen to be a mistake, when one realises the point of view; moreover, even nursery rhymes call for intelligent effort when they become the medium of learning a foreign tongue. They are soon left behind; the matter of the book becomes quite difficult enough, especially in the case of the poetry. Poetry is made a special feature of the book, in accordance with its object, which is to arouse and direct the feelings. The selection is extremely good, the compilers having avoided altogether what is silly, affected, or *un*poetical. It appears to me this is the right plan, though compilers of school reading-books seldom seem to think so. We may grant, indeed, that poetry is inevitably spoiled when dissected for the purposes of linguistic training; and on that ground it may be urged, paradoxically, that the best poems should not be desecrated in school-books. If this view is adopted then there is no reason to regret that the following stanzas are indelibly engraved on the minds of some thousands of Germans:—

Our home is the ocean,
  Our grave is the deep;
We feel no emotion
  As on it we sleep;

* * * *

With waves in wild motion
We love it the most,
And 'tis our endeavour,
In battle and breeze,
That England shall ever
  Be lord of the seas.*

* I do not know the author of this divine song; it figures in more than one very popular reader. I have heard it sung to more than one tune.

This is not, however, my own idea, especially considering what irritation such writing inflicts on the poetical teacher—if such there be. And it so happens that in English we inherit, from Mrs. Hemans, Tennyson, and Longfellow, a large treasure of poetical poetry suitable for children.

Vietor and Dörr's book is, for a reader, the noblest effort I have seen to associate the Direct Method with culture, with the traditions of humanism. The authors wish to make the study of English not merely an instrument of power but a source of inspiration; and an English critic, in appraising the value of their work, feels bound to pay them a tribute not merely of admiration but of gratitude.

### Section XIII.—TEXT BOOKS FOR HIGHER CLASSES.

I pass on now from the discussion of readers for beginners to the question of books for the higher classes. It is evident that when we come to these we have two plans before us. We may give our pupils either books of selections (Chrestomathien, as they are called in German,) or larger works, each of which may suffice for half a year or more. Both plans have their advocates; but in the case of middle classes it is more usual to employ selections. In the upper classes I think most teachers prefer complete works; probably because it is offensive to the literary sense to be nibbling at extracts. Of course extracts offer many advantages. Where we are at liberty to choose short passages we can choose more exactly what we want, in point of style and matter. Those who would like to see the very best that can be offered an upper class, in the way of extracts, may turn to the final volume of *Schweitser and Vincent's English Course* referred to above. This contains 265 pages, which illustrate in all its aspects the history of England—Political, Intellectual, Social, and Moral. The pieces are mostly selected from writers of the nineteenth century, such as Gardiner, Green, Freeman, and Carlyle. There are, however, a few from older sources, such as Scott, Swift, and Foxe. Germany has at present, as far as I know, no series of selections so scientific as this. There is Herrig's Chrestomathien,

which is now felt to be somewhat antiquated; and I believe there will shortly be a new selection edited by Professor Morsbach and Mr. Tamson of Göttingen. Nor have I come across a good book of extracts suitable for middle classes. Some which I have found in use are quite obsolete; and, as a matter of fact, most schools, when they give up their reader, turn for a text-book directly to an author.

Let us see, then, what is required in the case of such an author.

I. In point of matter, he must deal with some aspect of English life; preferably, contemporary life.

II. In point of style he must be—

(i) not too difficult or obscure,

(ii) not antiquated,

(iii) sufficiently dignified or distinguished to be in some sense a classic.

When we have stated these requirements we perceive that authors who conform to them are not exactly plentiful. When we have named Macaulay's Essays we seem to have named the only writings that really fit the case. I leave to the reader the long task of scrutinising other possibilities. When he has finished it he will probably have found that every work which suggests itself is either too long, too difficult, antiquated or undignified.

Something must therefore be sacrificed; and a plan which finds much favour in Germany is to sacrifice the ambition of reading, in his original grandeur, a classical author. There are in use many edited editions of classical authors, in which phrases have been modified, difficulties omitted, and lengthy passages abbreviated. Morley's *Life of Cromwell* has been treated in this way; and Hume's *Reign of Elizabeth*. (It will be observed that Hume does not conform to the canon of modernity.) There is a great deal to be said for this plan, though it will always appear to the scholar an impious act to remodel a classic writer. The edition of Locke's Essay used in Hamburg had been edited in this manner, quite successfully; and I found a very good compendium of Seeley's *Expansion of England*. Those who wish to examine books of this

character will find many published by R. Gaertner of Berlin; or by Velhasen and Klasing of Leipzig. But they will probably agree with me that few of these publications really hit the mark. It is astonishing how few classical writers are or can be made fit for school-boys, if we wish them to conform to the canons laid down above. We do not feel the same unsuitability in the case of Greek and Latin classics, because we judge them exclusively from one point of view and overlook their defects. And I may say that English seems to offer a narrower field of selection than French, where the vitality of the drama has brought into existence many comedies which are (or can be made?) suitable for schools. I reprint one catalogue of school-books which presents a very special and recent effort to meet the difficulty. It is called (by a gloriously compound title) the *Neu-Sprachliche Reform-Bibliothek* (New-Speech Reform-Library), edited by B. Hubert and F. Mann, published by A. Rossberg, Leipzig. Each book contains notes (in English), explanations of the hard words, and an introduction. The texts are freely adapted and edited.

*The Victorian Era* (chiefly on outward changes in life).
*Kipling: Three Mowgli Stories.*
*Julius Cæsar.*
*Peter Simple.*
*Selections from Macaulay.*
*W. Irving: Sketch Book.*
*Stevenson: Treasure Island.*
*Kingston: Naval Life.*
*J. K. Jerome: Diary of a Pilgrimage.*
*Seeley: Expansion of England.*
*Dickens: A Christmas Carol.*
*The Great English Poets of the XIXth Century.*

It will be observed that in each of these books some qualification is sacrificed; also that many tastes are catered for. Shakespeare is as much admired as ever in Germany; it is still the ambition of all good schools to complete their course with one of his plays. Julius Cæsar is generally chosen, quite rightly, as the one most suitable for their purpose. The examples of school curricula in Appendix F

will provide examples of text-books actually used in schools. I should add that for middle classes in German schools Mr. Stead's collection of *Books for the Bairns* has been found useful by many teachers. This of course is published by Mr. Stead himself in England. Most of the volumes contain tales, and they are generally very well constructed and written. Their price, too,—1*d.* each—a recommendation. German school-books are not remarkably cheap; English books are cheaper, and also, I think, in point of type, binding, illustrations, and style, they are better. They do not, however, offer the same range and choice of matter, but a comparison of English and German books would be out of place in the present report, and I have not at present material to undertake it.

Nothing has yet been said of the manner in which text-books are handled in the upper classes. But a few words will suffice, if the reader will bear in mind the principles underlying the Direct Method, which have been brought to light in explaining the first steps of the course. The matter to be taken in hand may or may not, in the first instance, be prepared by the pupils at home. The general principle is that home-work should travel over ground already prepared. But it is sometimes necessary to depart from this, especially in the case of a difficult author like Shakespeare. Some preliminary assistance is usually offered by the master; he explains the chief difficulties in a new passage; and then hands it over to the boys to prepare. Next day it is to read in the class; in some classes it is a custom for the boys to begin the lesson by mentioning individually difficulties which they have been unable to overcome. The master makes a few comments on these; and then the lesson proceeds. The author is read aloud. He is not construed, but informally paraphrased; the master gives orally such information as he thinks proper regarding allusions, etymologies, and other points. German school-books, very properly, reduce printed notes to a minimum; the school-master enjoys the luxury of being himself the source of information for his class. Nor are the boys much encouraged to write down notes of what he tells them, even in the highest classes. I have seen a little of this done, but very little. It is the rule to rely on constant oral repetition.

Of course this method, too, may have its disadvantages. Even in the highest class of a German high school there is a brisk fire of short questions and answers; and this does not quite suit the spiritual side of the work, to which it is sometimes applied. I have sometimes missed in such classes the air of dignified repose which stamps the Upper Sixth of an English public school—at its best. But the complete discussion of this topic would carry us too far for the purpose of these pages.

Composition generally takes the form of recapitulation of the text-book. Such recapitulation is always proceeding, whether oral or written. Sometimes a formal essay is prescribed; and as the Leaving Examination draws near, Translation is in some cases practised.

I need hardly say that all explanations are given in English. In proportion as Accidence and Syntax are mastered, more time is left free for general literary information; and of this the higher class receive a great deal. In many cases they know the general history of English literature remarkably well; and here, as in other subjects, they leave school with a first-rate store of information. Moreover, this information is well under their control; as I have already said, German boys are exceedingly versatile.

One small point I should notice in connection with the teaching of poetry is, that a good deal is committed to memory. This is done from the very first; the beginners learn *Little drops of water;* the Ober-prima *Mark Antony's Speech* or *Enoch Arden.*

## Section XIV.—COMPARISON OF GERMAN METHODS WITH INDIAN.

As I have now finished my survey of German methods the reader may expect that I should point the moral of the tale in connection with our Indian schools. Unfortunately, I am not well qualified for such a task. My knowledge of Indian educational methods is confined to one part of India, the Presidency of Bombay; and even within that Presidency, as I am neither a school-master nor an inspector, it has been gathered in a casual

way and is quite of an amateurish character. Nevertheless, it is true that some suggestions have presented themselves to me, and I put them forward, I may say, with diffidence.

Let us observe first, however, that any inferences from Germany to India ought not to be drawn without a due sense of the difference between the two countries. This difference will not be realised, especially by an Indian reader, without careful reflection.

Even in Germany the conditions under which English has to be taught vary a good deal in different parts of the country. In Hamburg, for instance, the teacher's task is easier than it is, let us say, in a country town of southern Germany. In the former town there are many English visitors, and many trade relations with England, so that English models of pronunciation and idiom are at least occasionally brought before some of the students. In the latter town such models are comparatively rare; in fact they may scarcely exist. Moreover, the people of Hamburg have a further advantage in the phonetic similarity between their own dialect of German and English. The advantage is found in practice to be a very real one.

So, too, in India the teacher's task is different in Bombay from what it is in some small country town. This is obvious enough without entering into details. It is clear, therefore, that general comparisons between Germany and India must not be made too rigidly.

On the whole we may say that the Indian teacher's task is in one way much easier and in another very much more difficult than the German teacher's. It is much easier from a linguistic point of view, because he and his pupils are more in contact with the foreign language. The difficulties of that language in itself may, I think, be assumed to be about equal in both cases. German and English have of course common elements; there is a number of words which may (by an experienced eye) be recognised as representing the same root in each language. But this connection is often misleading; while in point of sound and construction German differs widely from English. This perhaps follows from the fact that German is, like Marathi,

highly inflected and fond of long compound words. I really doubt if a greater interval in any way separates English and Marathi than that which separates English and German.

But the Indian teacher, as I have said, has more opportunities to perfect himself in English than the German teacher. He has generally been, at the university, to some extent educated by Englishmen; he is accustomed, to some extent at least, to read English and to speak English as a medium for the exchange of ideas. The German teacher has no occasion and few opportunities to use English in this way. He may have, probably has, studied English at the university; for most German universities have a Professor of English. But the subjects on which this Professor chooses to lecture are generally not such as to assist the future teacher. I gather that he usually interests himself in obscure questions of philology; and that German students who aspire to a degree in English generally offer for their thesis a treatment of some point in Anglo-Saxon or Mediæval English. This does not help the teaching profession much; and one of the questions of the day in Germany is how to secure efficient teachers of modern languages. In India, as far as command of English goes, there are plenty of qualified men.

But the task of the Indian teacher is more difficult than that of the German teacher when we approach the subject of Realien. Germany, if not quite the same sort of country as England, is not fundamentally different. It is not difficult for a German boy to realise what he is told about England. For an Indian boy to do the same thing is so difficult as to be in many cases impossible. Nor can his teacher give him as much assistance as many German teachers can do; since no Indian school-masters visit England. And I need not say that a practical acquaintance with a country in many subtle ways multiplies the teacher's power of describing it and expounding its literature.

Let us pass from a comparison of the conditions to a comparison of the results. Here again we must be very careful to see exactly what it is we are comparing. I am not in a position to pass any general verdict on German schools. The schools which I visited

were selected for my visit precisely because they were progressive and successful institutions. Of other schools, which I did not see, I am not in a position to say anything, except what it is superfluous to say, *viz.*, that probably they are not all equally good. Regarding Indian boys, I form my opinion of them from the students in the Previous Class at Deccan College, where, I believe, they were rather above than below the average in merit. It should be remembered that the students enter this class a little younger than boys leave a German high school. Making the comparison, then, within the limits I have indicated, I should say that under the German system the average level attained is higher. The boys speak English more fluently, understand it more readily, and their knowledge of Realien is greater. But if we took the high schools of Bombay, we should find in them more boys who spoke English *very* fluently than we should find anywhere in Germany, even in Hamburg.

In estimating the achievements of the German schools it should not be forgotten that the same pupils possess on the whole the same knowledge of French as of English. Then in a Gymnasium they learn Latin as well. I ought no doubt to have some impression as to the difference between the English attainments of an Ober-Prima in an Oberrealschule and those of the Ober-Prima of a Realgymnasium. Some difference there must be; but I have no clear recollection of noticing it.

It may be asked, then, whether the Direct Method could be introduced into Indian schools? I prefer myself not to express any opinion on this point. But we may consider how exactly such a change would affect the Bombay system. English is here taught in the middle standards as a specific subject, by the usual method of translation, with explanations in the vernacular. In the upper standards, it becomes the general medium of instruction. We really have, then, in these upper standards something like the Direct Method, but it is not systematically organized. It is possible that by such organization, and by beginning English on the Direct Method at once, we might attain the present standard on the highest class with fewer hours of instruction

in English. This would make it possible, if desirable, to continue some of the high school education up to the top in the vernacular.

There are grounds on which such a change might be desirable. It is becoming clear that our high school education is not exactly playing the rôle in the country which it was intended to play. That rôle was settled by Macaulay and his contemporaries in accordance with a perfectly reasonable and enlightened policy. The high school was intended to educate a small but accomplished minority, who should form the channel through which Western ideas should be conveyed to India. For this purpose it was necessary that they should have a thorough knowledge of English; and in Macaulay's day, the Direct Method not having been heard of anywhere, this condition alone would have required that English should be the medium of instruction. It was further intended that practically all of these pupils should go on to college, and that students who did not aspire to this finished education should as a rule be educated completely in the vernacular. The Bombay system, in accordance with this scheme, provides a complete vernacular education, which reaches a standard much on a level in attainments with that of a high school. But owing to various general causes the high school has not maintained the position designed for it. The number of boys attending high schools has enormously increased, and many of these boys do not desire to proceed to the University. They want English for certain practical purposes, not by any means for the purpose of reading books. The books they will read, if any, are vernacular books; and they are most likely to read these if they have been educated in the vernacular. Now, this might be possible in a higher degree than at present, if the English standard necessary for the university could be attained without carrying on the work of the upper classes entirely in English.

I make the suggestion because the interests of the vernacular as a language must always be a matter of anxious interest to any theorist on Indian education; also because I think it is only the brighter pupils of an Indian school who really grasp the part of

their education which is presented to them in English. But even if these ideas were accepted there remain many difficulties in the way, especially in those parts of India where all the pupils of a school rarely speak in the same language.

It is possible, again, that the Direct Method might be found useful, in a humbler way, for those schools which are required, in large towns like Bombay, to impart a slight knowledge of English to boys whose education is, on its solid side, vernacular. In such schools English plays a part resembling that which it plays in the primary schools of Hamburg. Possibly the Gouin method might suit such schools.

Relinquishing the question whether the Direct Method should be imported bodily into India, we may turn to a few practical suggestions concerning methods which might be useful under any system.

I have not had occasion to scrutinise the public examination papers in English by which the work of our schools is controlled. But I believe that they would sometimes be found to encourage kinds of work which, according to the principles of the Direct Method, are useless. Such questions, *e.g.*, are those which ask for lists of all kinds; because where these questions are expected, much time is wasted in committing such lists to memory. Those who have to set papers for school-boys seldom realise, unless they are school-masters, what a great difference is made in the year's work of a class by the introduction of one harmless-looking question.

A minor point in connection with the teaching of grammar arises over the system of parsing. It appears to me that our English system is too prolix. If the pupil is asked to parse a noun he starts off "common noun, neuter gender, nominative case, subject to ....." and so on. A good deal of this is uninstructive and wastes time, which is very valuable when a large class of boys are waiting for a share in the work.

The principles on which etymology is taught in Indian schools require examination. The German principle is to use etymology to bring together classes of familiar words. The more familiar the

words are, the more useful etymology is found.* In India, these useful connections are sometimes neglected; while very often boys are taught the derivations of rare and peculiar words and their peculiar collaterals. Some examiners encourage this. If the reader has the curiosity to stroll round the examination hall of the Bombay University, when the students of the Previous Class have gone in to face their English papers, he will be able to pick up sheets of manuscript containing lists of derivations, which include words from Icelandic, Mœso-Gothic, and other weird tongues. This deplorable form of cram might be and ought to be prevented.

A branch of work which is familiar to us in India is paraphrase, meaning by this rather written than oral paraphrase. I know more about it myself in connection with university examinations than with schools. In these it is intended to play the same part as artistic Greek and Latin composition used to play in the old classical education. The piece of English set is therefore a finished and difficult piece, usually of verse; the problem of the candidate is to turn it, if possible, into equally finished prose. Now, in practice the whole affair is a failure; and the reasons why are obvious. To make a really good paraphrase of this kind is a very difficult and lengthy task; to make a bad one is brief and easy. It is not found profitable in the way of marks, amid the hurry of an examination, to spend as much time on the paraphrase as it would require to produce high-class work. I may say, as a fact, that there is not one paraphrase in a hundred at our Previous Examination that possesses any real merit; and there never will be, as long as the paraphrase is one amongst a variety of questions. The temptation to scamp it is too great. If retained at all it ought to be given a place to itself, as Latin prose is at English examinations: or at any rate it ought to be associated with nothing but the Essay paper.

It is a question, however, whether this style of paraphrase is really worth retaining; it is quite a different thing from paraphrase

* Compare the specimen groups of words printed by Direktor Walter, in *Englisch nach dem Frankfurter Reform-plan*: "Isle, île, insula; forest, forêt, Forst; conqueror, conquest, conquête; empire, emperor, imperator, impératrice; reign, règne, regnum; royal, regalis; carry, car, carriage, cart, etc., etc.

of a sentence which is easy and commonplace in itself, and is presented as the basis of commonplace metamorphoses. No doubt it aspires to effect something more; but it certainly should not be retained, except in connection with systematic teaching. University students can seldom receive such teaching; it is out of the question with our large classes. What happens is this; some of the students deliberately accept the necessity of writing a bad paraphrase, and trust to making up the marks elsewhere; others 'cram' up the passages in their books which are likely to be set and learn by heart the paraphrase provided for them by some thoughtful publisher.

In the course of these suggestions I am thinking of the junior classes at universities, which correspond somewhat in age to the Ober-Prima of an Oberrealschule. I have to a certain extent the same classes in mind in passing on to speak of text-books. In the selection of these we have been met by much the same difficulties as German schools. But we have not kept quite such a clear object in view. The upper classes of Indian schools have been influenced by the old ideals of the English Public Schools, in which the upper classes read difficult Latin and Greek authors. Here it may be observed that in such English schools very few boys really comprehended these authors. In days gone by nobody mourned much over that. It was regarded as natural that most boys should be content with very small intellectual gains, and there was a sort of understanding that the system was devised more for the few exceptional boys than for the average. But in the case of India there is no such understanding; we feel that our schools ought to suit the average boy more, if anything, than the exceptional boy. The classics of the English language do not assist this aim; they are too difficult. If they are read in schools, then either (i) the amount of ground traversed must be very small, or (ii) the burden laid on the weaker boys is too great. This will be understood very well if we consider the position of a VI Standard dealing with Pope's *Essay on Man*—a phenomenon that I have witnessed.* This was

* No books being prescribed by the university for the Matriculation or School Final Examination, the schools have in the past been at liberty to choose their own books.

an extreme case, no doubt; but there is a tendency, under the classical tradition, for schools to choose books which are too classical. German schools no doubt fall sometimes into the same error. It might be maintained that the ambition to read Shakespeare at school always leads to it. But on the whole it is strongly felt in Germany that school text-books should be devoid of dry difficulties and obscurities; their style should be clear and lively and well within the reach of the pupils.

It would be a real service to Indian schools if some one would take up this whole question of text-books and readers and publish a guide to them. Such a guide should be extremely practical, and indicate clearly the contents, style, and degree of difficulty of the books.

I continue this topic a little further to deprecate once more the use of dry and obscure books in the upper classes of schools; and especially books which abound in 'allusions.' It is characteristic of English literature to be very allusive, and allusions, especially in the junior classes of universities, are a trial to the Indian student. Unfortunately, in these classes, the whole study of English literature often degenerates into 'getting up' these allusions. The students feel that they must get them up because they may be 'asked' any of them; the mediocre students indeed prefer to be asked as many of them as possible, because, being only memory work, they are safer ground. The desires of these students, reacting on publishers, bring into existence books of notes which are perfect encyclopædias of useless information. Professors themselves being obliged to compete with these books, and knowing what many students want, are weighed down by the explanation of allusions. Of course if we take an examination paper, it does not by any means consist wholly of questions on allusions; but appearances are deceitful, and the questions which do not deal with these allusions are often answered out of an Introduction which it has taken only a few hours to get up. The remedy for the situation is not obvious; but partly at least it may be found in vigorously excluding from schools and junior university classes books which are too allusive. To set *The Sketch Book* or *Bracebridge Hall in extenso*,

for the Previous Class, seems to me on every ground indefensible. Where W. Irving is used in Germany, (as unfortunately he is,) at least his simple writings are chosen, or his allusions are edited out of existence.

Indian school-masters have much to learn in the way of treating 'Realien.' But they have also in connection with these a very difficult task; and one may hope that it will be found possible to give them more assistance in the way of pictures, etc., than they have usually had in the past.

One topic yet remains on which a few words may be said, the possible use of Phonetics in India. I do not think that phonetic instruction need play or ever will play a conspicuous part in class work, in districts where English people are common. And even where it might be useful, I seem to find a reason why its use would not be quite the same in India as in Germany. As far as my own limited observation goes, it is not the beginners who have most difficulty with English pronunciation. These, especially if they begin before their voices break, seem to attain with ease a very pure and pleasing pronunciation. Five years later, however, that pronunciation has deteriorated. The influence of the vernacular pronunciation seems at that age to preponderate, and the pupils who enter college sometimes speak English almost unintelligibly. At college, listening either to an Englishman, or to an Indian who speaks with a good accent, they improve, but not very quickly and perhaps not very much, because, though they hear a good deal of English, they speak very little, as they always talk together in their vernacular. Later on, when they have left college and entered perhaps some public office, they not only hear English well spoken, but have to speak it themselves, and their pronunciation improves a good deal. It is not uncommon anywhere in India to find men of middle age whose English pronunciation is at least so good that it would not be worth while to trouble about correcting it. It might be said, therefore, that without the aid of Phonetics the object of pronunciation is sufficiently attained. But it would be more satisfactory on many grounds if our pupils left school with a more finished accent; and it is possible that teachers

might do more to train them if they were acquainted with the exact sources of their errors, as detected by phonetic research.

The first step towards this end would be an enquiry into the phonetics of the Indian vernaculars. The enquiry would need to be undertaken in each case by a man with leisure, patience, and a good ear. It may be recommended to the notice of young school-masters who would like, after the German ideal, to do a little original work. Should any such read these pages they will find in Appendix F. the names of one or two books that would introduce them to a knowledge of the science. There is an active Phonetic Association in France, of which the leading spirit is Dr. P. Passy, 20 Rue de la Madeleine, Bourg-la-Reine (Seine). The organ of the association is Le Maître Phonétique, and contributions from India would no doubt be welcome.

# APPENDIX A.

## The Prussian Code for High Schools, 1901.

### A. Gymnasium.

(*a*) General objects.

Accuracy in pronunciation; mastery of accidence, of the most essential rules of syntax, and a sufficient vocabulary; together with oral and written practice in the language, resting on these as a basis. The comprehension of easy authors.

(*b*) Distribution of the course.

O. II.—O. I. Two hours a week.

It is not necessary to lay down a sharp distinction between the different parts of the subject-matter. The principle to be observed is that the method must be essentially empirical. The object in view is to secure, by careful practice, throughout the course of reading, accuracy of pronunciation, so as to lay a foundation on which a future structure can be raised. Practice in reading, writing, and speaking, as well as the acquisition of a vocabulary, are also intended to serve this same purpose. The most essential rules of grammar are to be dealt with inductively, and taught out of some brief compendium; everything else is to be treated as it arises in the course of reading. At first a reader is to be used, but in the last year at least some appropriate author.

### B. Realgymnasium.

(*a*) General objects.

A comprehension of the most important writings since Shakespeare; and practice in speaking and writing the language.

(*b*) Distribution of the course.

U. III. Three hours a week.

The acquisition of correct pronunciation by actual practice. Practice in reading; first steps in conversation at every lesson. The acquisition of a reasonably large vocabulary.

Regular accidence; a minimum of irregular accidence; and reference to syntactical rules only so far as these are necessary to explain inflections and make the matter read intelligible.

Written and oral translations from the reader; or else composition.* Practice in orthography.

* In translating this Code, the word 'composition' has been used for 'Freiere Ueb ungen' any kind of written exercises in the foreign language which do not represent a translation from the mother-tongue.

### O. III. Three hours a week.

Continuation at every lesson of the practice in reading and speaking; extension of the vocabulary.

Repetition and complete mastery of the accidence. Commencement of an elementary course in syntax, dealing with the cases governed by the verbs; the use of the infinitive, gerund, participle and auxiliaries.

Practice in writing and speaking as in U. III.

### U. II. Three hours a week.

Easy prose and some poetry to be read.

The elementary course in syntax to be continued and completed, especially with regard to tense and mood; the most essential rules for the use of the article, noun, adjective, pronoun and adverb. The most important auxiliaries.

Practice in writing and speaking: recapitulation of matter read and related in class.

At every lesson, practice in expression, as a sequel to the matter read; especially practice in dealing with the events of daily life. This is to be continued in every class, according to a systematic plan. Extension of the vocabulary, both of words and phrases.

### O. II.—O. I. Three hours a week.

Everything is to be subordinate to the task of reading. Instructive modern prose works in various departments, including public speeches; suitable poems, especially select plays of Shakespeare. The object in view is to provide the pupils with an insight into the special character of English literature, as illustrated by representative works since the time of Shakespeare. Considerations regarding style. Metre and synonymous words are to be introduced, as opportunity offers, in connection with the reading matter.

The knowledge of grammar is to be widened and deepened; the etymology and history of the language are to be dealt with.

Practice in writing and speaking as in U. II. The pupils should be accustomed to easy exercises in composition, dealing with concrete objects,—at any rate in institutions where special weight is attached to English rather than French. They should form some acquaintance with the technical terms of the arts and sciences. The practice in conversation may deal with the reading matter; it may also extend to the events of daily life, and the information which the teacher imparts concerning England and the English people.

## C. Oberrealschule.

### (*a*) General object.

The directions are essentially the same as those for the Realgymnasium. More time being available, the pupils may receive a more thorough training in

grammar, in conversation and composition, and enlarge the range of their reading. Compositions of an imitative character are more permissible here than at a Realgymnasium; and exercises of a technical character, *e.g.*, letters, may be introduced. The pupils should acquire English modes of expression; and master an extensive, even a technical, vocabulary. The grammatical course may be distributed as follows:—

(*b*) Distribution of the course.

O. III. Five hours a week.

Regular and irregular accidence; the rules of syntax to be introduced, so far as is necessary to understand the form of the sentences and the matter in the reader.

O. III. Four hours a week.

Syntax of the verb, with special reference to the cases governed by the verbs, the use of auxiliaries, the infinitive, the gerund, the participle; tense and mood.

U. II. Four hours a week.

Syntax of the article, verb, adjective, pronoun, adverb. The most important conjunction.

O. II.—O. I.

The previous instruction in grammar to be recapitulated, widened, and deepened, always in connection with the matter read and the written exercises.

REMARKS ON METHODS, APPLICABLE BOTH TO FRENCH AND ENGLISH.

1. *Pronunciation.*—To effect and secure a good pronunciation must be an object of anxious care at all stages. When this has once been imparted by a special preliminary course, and the pupils have mastered it sufficiently by constant practice, it must still be constantly watched, and as time goes on, teacher's demands in point of accuracy, fluency, and correct accent must constantly increase. When the teachers of an institution perceive that the pronunciation of their pupils is defective on particular points, they must concentrate their attention on these. They must also endeavour to make this training of the organ of speech serve the purpose of perfecting the pronunciation of German.

II. *Practice in conversation.*—This must begin in a simple form in the earliest lessons; it must continue throughout all the classes, and must not be omitted in any single hour of instruction. The demands of the teacher must be continually raised, and this not only in point of matter, through a gradual

systematic extension of the pupils' range of subjects, but also in point of expression, by requiring more and more fluency and formal control of language. At the same time simple dialogue must constantly be carried on. These will supplement the exercises in conversation arising out of the readers, and will be valuable for the purposes of daily life. For this purpose may be recommended the use of pictures, at once instructive and artistic; also maps and other similar agencies. In all these exercises however care must be taken that the process does not degenerate into a mechanical exchange of questions and answers. Teachers are specially warned against attaching too much importance to the external features of life in a foreign country, and at the same time neglecting points of more importance for the relations of these countries with Germany.

III. *Vocabulary of words and phrases.*—Closely connected with practice in conversation is the acquisition of a vocabulary. This must not be too narrow; it must closely follow the concrete facts of life; and it must include from the earliest stages an equipment of recognised current phrases. It must be attained as far as possible by reading appropriate passages; by observation of pictures, and by reference to the events of daily life; and lists of words arranged under different headings will be found of service. In the upper classes the pupils may be exercised in bringing together groups of words connected by meaning or etymology; this will serve to confirm their knowledge and to stimulate their interest in the language. Moreover, the process of imprinting words on the mind offers many opportunities of illustrating the development of speech, which may be used in accordance with the stage reached by the class.

IV. *Reading.*—Reading is the most important department of instruction; and at least in the second half of the whole course should consist of instructive matter presented in an elevated form. In selecting a text-book the object is to find one that affords an introduction to the institutions and life of the foreign nation; in 'Realschulen' matter connected with the arts and sciences should not be forgotten. The matter presented by many school editions requires to be carefully weighed, to avoid wasting time over books that are injuriously narrow in their range. Considering that the text-book has to be the basis not only of exercises in conversation, but of grammatical and other instruction, much care must be taken to see that it is serviceable. At every stage, and in a growing measure, efforts must be made to secure that English and French texts shall be read with fluency, vigour, and a correct accent. It is recommended that with this object in view the pupils should learn by heart and carefully recite select passages of prose and poetry. Those who wish to replace translation into good German by a treatment of the text in the foreign language itself can only be permitted this liberty if it is found that by accuracy on the part of the teacher and gradual development of the pupil's powers this procedure as much as the other ensures a complete comprehension of the matter read.

V. *Grammar and other theoretical branches.*—Grammar is no doubt to be made subordinate to reading, at the same time it must be systematically dealt with, and the various classes must be allotted suitable grammatical exercises. A systematic knowledge, simplified as far as possible, must remain the pupil's final goal. This applies especially to Realschulen, but in a measure also to other

institutions. Analogies between all the languages learned by the pupils should be pointed out. The usual sequence of accidence and syntax must be observed, but it is permissible for teachers to deal early with the important rules of syntax and to postpone parts of the accidence which deal with exceptions. The chief object must be to master all ordinary forms; it is sufficient for exceptional forms to be explained as they arise in the course of reading. In the upper classes possibly the grammatical instruction may become more profound; usages of language may be explained by logical and psychological considerations, or approached on their historical side; but this is a matter which must be settled by the circumstances of each institution. In no case must such 'profundity' replace practical power; the most important aim must always be to confirm this power by constant repetition. The use of grammars written in French and English cannot be permitted in schools.

As regards the treatment of synonyms, metre, and style, practical considerations are decisive; some knowledge may be imparted, as opportunity offers, by reference to actual examples. The relation between knowledge and power is different in the case of living languages and dead; in the former case many-sided living power, in the way of expression, is naturally the chief aim in view.

VI. *Written exercises.*—Though oral accomplishments are most important, regular written exercises are not to be regretted. The rule may be laid down, that in Real-Institutions, at least in the lower and middle classes, one written exercise, even if it be a short one, must be prepared every week; in the higher classes and Gymnasia, at less frequent intervals. Written exercises should, speaking generally, not be confined to translations into the foreign tongue; the pupils should be practised in manipulating sentences to illustrate the rules of syntax, in recapitulations of all kinds, especially in Real-Institutions. This will prepare the way for more elaborate compositions in the upper classes. Written translations may occasionally be replaced by compositions, but only under the same conditions as those already stipulated in dealing with texts; they cannot, however, be altogether abolished. The pupils must advance from word-for-word translation to free rendering of the author's thoughts in the outward form of the new language. Essays produced by the upper classes of Real-Institutions, (of which about four should be written every year at home, and two in the class,) should not be confined to historical or military episodes; they should deal with a wider range of subjects.

VII. *The language of instruction.*—It is desirable that the teacher should employ the foreign language, as far as he can do so with success, but he must take care to be thorough and impressive. For explanations which go deep and are difficult to follow, especially in the case of grammar, he must, as a rule, return to the mother tongue. On the other hand, the foreign language should generally be employed in dealing with the life and literature of a nation.

VIII. *Concentration.*—Care must be taken at every stage to keep the different branches of instruction in relation to each other. Special attention should be paid to this in the case of the upper classes of Real-institutions, where this relation may easily be forgotten in the variety of aims presented.

## APPENDIX B.

### Regulations for the Leaving Examination.

I. The Leaving Examination is both written and oral.

II. The Written Examination will include at all institutions a German essay, and four mathematical problems in four branches; and in addition—

(*a*) at Gymnasia: a translation from German into Latin and from Greek into German. Those boys who offer Hebrew must translate into German a short extract from the Old Testament and explain the grammar of it.

(*b*) at Realgymnasia: a translation from Latin into German; and (conformably to the curriculum of the various institutions) a French or English exercise, with either an essay or a translation from German. A problem in Physics will also be set.

(*c*) at Oberrealschulen: a French and an English exercise, with composition in one of these languages and translation from German in the other. A problem in Physics or Chemistry will also be set.

III. The Oral Examination includes at all institutions Christian Doctrine; History; Mathematics, and in addition—

(*a*) at Gymnasia: Latin, Greek, and either French or English, according to the curriculum of the institution.

(*b*) at Realgymnasia: Latin, French, and English; Physics or Chemistry.

(*c*) at Oberrealschulen: French and English; Physics and Chemistry.

## APPENDIX C.

### Extracts from two of Dr. Borbein's Books.

(i) *Die künftige Entwickelung des neusprachlichen Unterrichts.* (The Future Development of Modern Language Teaching.) By Dr. H. Borbein. Reprinted from "Das Pädagogische Archiv," 1902.

(ii) *Chrestomathien in neusprachlichen Unterricht.* (The use of Selections in Modern Language Teaching.) By Dr. H. Borbein. Reprinted from "Das Pädagogische Archiv," 1903.

The author kindly forwarded me copies of these reprints, and I translate passages from them. Some passages are interesting and significant and illustrate the present aims of the progressive party.

"In the history of Prussia nothing is more remarkable than the width of view and the untiring energy with which at all decisive epochs our political and spiritual leaders have aroused and developed the inner forces of the nation, and sustained them through a long period of preparation, to employ them finally as

instruments of a decisive victory, and by this victory, within or without the limits of the country, to lay the foundations of a higher and richer national life. Through such a time of preparation we are passing to-day. But the object set before us is bolder and wider than ever it was in the past. Germany, under Prussia's guidance, is struggling to make herself a power not merely in Europe but throughout the world. Once entered on this path we must neither pause nor retire, but advance with cheerful confidence. In the struggle that lies before us, we know as a nation, and we need not be told, that the first condition of victory is to maintain and strengthen our military forces by land and sea, but we must also recognise the second and not less important condition—we have to develop all our powers to a degree which will ensure our spiritual superiority. On the accomplishment of this depends our national existence; for the coming struggle will be decided by economic strength, and the victory will go to the strongest here. Germany must then redouble her internal powers, for she has not and never will have the vast material resources of England, Russia, and North America, her opponents. From this point of view, then, primarily, we must decide how languages are to be taught, not from any abstract and ideal standpoint. We may hope that learning and æsthetic taste, the gifts of a spiritual aristocracy, will continue to find their place among the aims of our high schools, but we must recognise fully the right of entrance which belongs there to practical command of speech, and ability to judge the capacities, the merits and demerits of the civilizations around us.† * * * * * *

"It is the cause of English which will gain most. In the struggle which lies before us, the Anglo-Saxon race is, in a peculiar sense, our competitor. Whether we meet them in the friendly rivalry of trade or on the bloody field of war, we must arm ourselves with a penetrating knowledge of what they are—that is to say, we must study their history and their language. This demand affects not merely a part of our higher institutions but all of them, and all the more because it is a recognized principle of our educational system that our schools afford not special education for particular classes, but a general education for all. Our gymnasia accordingly are filled with future traders and engineers, with military officers, as well as theologians and philologians; and it is therefore their duty to provide in their curricula for the needs of these as well as for those of the professional classes. Moreover, it is my own opinion that no educated university man to-day can dispense with a knowledge of the English language and English civilization; otherwise he will lose touch with the life of his own nation and cease to co-operate in its development.

"If, however, anyone thinks that these economic and political considerations do not justify the inclusion of English in our schools curricula, then let me point out other considerations supporting this conclusion, which arise from the nature of the subject itself. Yes, it is true that, apart from the religion, history, and

† Dr. Borbein here contrasts this view with the instruction given in the French Code, that the study of modern languages "is not to be made an instrument of literary culture, or an intellectual gymnastic."

language of our own country, there is nothing to be found in history more adapted to advance the spiritual development of our own children than the Anglo-Saxon language and civilization. We understand them better in the profoundest sense of the word than those of any other people. The historical development, the visible tendencies, the moral code and social customs, both of England and America, afford a subject of study as interesting as it is attractive. Their literature is so rich in æsthetic moral and intellectual contents that it imparts a sense of noble enjoyment to any impressionable mind. And the language which enfolds all these treasures is in its own nature peculiarly adapted for the purpose of education being neither too easy to master nor insuperably difficult."

Dr. Borbein goes on to deprecate the ideal of 'mastering' English as a language. He apprehends that if this is attempted German style will suffer. One can only say that if the influence of English (or of French, either) should help to extricate German prose from the Elizabethan intricacy in which it is now confined, not only foreigners but Germans themselves might be grateful. However, let that pass. The allusion to bilingualism is interesting; the subject is important in India, but no one has yet brought together the available facts regarding it. Dr. Borbein also protests against the tendency to excessive 'utilitarianism,' but we have this protest more effectively expressed in an extract from the other pamphlet:—

"If we take for our paramount object the power of speaking and writing the current English of the day, we must adopt the following rules:—(i) We can only consider (for our text-books) contemporary or very recent work; the earlier a work is, the less useful it becomes. (ii) Even with this narrow range the number of possible authors is very limited. Only those writings can be recommended which keep strictly within the range of educated conversation; in proportion as the language of a book is removed from this character, as it takes a line of its own, whether scientific, artistic, or purely practical, the less useful it becomes for scholastic purposes.

"I must say expressly that I cannot agree with such a view, however brilliant might be the results that followed in the way of conversational power. It would cause our high schools to languish, especially in the upper classes; we should inevitably fall back into the old courses; and perhaps it would bring about an even worse consequence, a despair in the educative power of modern languages."*

"The often-heard expression, 'to think in a foreign language,' may easily lead us to overvalue the advantages of mere intellectual command over the language. In opposition to this it may be maintained that the special character of its idiom is least of all brought to light by the expression of thought, and far more by the other spiritual activities of feeling and willing. It is when these

* Dr. Borbein here uses the word 'Cultur,' which covers in German all aspects of human development, whether practical or abstract. In English 'culture' is used of developed powers considered from an abstract point of view, either æsthetic or moral.

powers are exerted that a language attains to true individual life, and distinctive national colour, as we call it. Mere external science, which is concerned with identifying and explaining the objects of sense, does not create speech, any more than the Art which employs its results to bring into man's service the powers of nature, or the dry practical sense which sees in the outer world only opportunities to develop such science and such art. But when deeper interests, personal or other, come into play; when we struggle for the possession of the higher treasures of humanity; when we approach questions of morality or ethics, or the relations between outward possessions and our hearts; then all the sleeping capacities of our souls are aroused, and these create a language of their own, in which all the rich and varied gifts of man find expression. This fact, in my opinion, should lead us decisively to reject that tendency which regards it as the chief object of modern language teaching, as far as its subject-matter is concerned, to impart to our pupils as many facts as possible from the external life of a foreign country, whether they be facts of daily life or of science, so long as they only stimulate the intellectual powers of thought and observation. * * * Only when the spiritual life of a nation finds full expression, can we say, with any meaning, that we are allowing the foreigners to speak for themselves."

## APPENDIX D.

### Extract from Direktor Walter's book.

*English according to the Reform-Plan at Frankfort.*—Under this title Direktor Walter has published a complete account of the method adopted at the Muster-schule. It is probably the best account of the Direct Method, as practised in Germany.* I subjoin a translation of part of Chapter III:—

"If we wish to attain in one year all that has hitherto been acquired in three years of English instruction, we must take every opportunity to make the pupil at home in the foreign language, and we shall find actual speech a better means for the purpose than all other processes that have hitherto been admired. But speech is not the end in itself; no, it is an introduction to the language, and enables us, sooner than anything else, to comprehend the language quickly, in its written or its spoken form. Therefore we must make it our first principle to employ the mother tongue only when it affords the quickest route to the comprehension of the foreign tongue; we must avoid it whenever we can attain this end by gestures, by objects or pictures, by reference to something already known, by description in the foreign tongue.

*Direktor Walter bases his method on the assumption that Dr. Hausknecht's *English Student* is the text-book of the class, and constant reference is made to this book.

"The simplest procedure is by means of direct intuition,* which brings the object or picture immediately before the eye, in connection with its foreign name.

"For our purposes we must make our English lessons from the first more interesting to young boys than they found the long monotonous written exercises of the past. I recommend therefore a greater use of connected passages—poems, dialogues, and tales; as far as possible these should be imprinted on the minds by intuition, but where this fails we may introduce some reference to the mother tongue. We shall find German helps us at many points; and assistance may also be drawn from the course of Latin and French instruction.

"Poetry imparts a command over pronunciation; the rhythmical structure of the verse makes it easy to secure and retain a good accent.

"We may introduce the class to prose by means of dialogues, and in these we may arouse the boys' interest by fresh and attractive pictures of the school-life of their English coevals. Here we have at once reference to their own lives and opportunity of relating the unknown to the known and thus our practice in conversation will remain in contact with our pupils' own daily lives. The 'Narratives' which succeed the dialogues enable us to treat the matter more fully and offer opportunities to reproduce between our own boys the relation existing between English friends at school together.

"Accordingly the teacher will from the first avail himself of intuition as much as possible; *e.g.*, in the first dialogue he will explain by reference to actual objects such words as *room, school, trousers, socks, sponge, floor, hair, brush, comb.* So in the same way he will explain or reproduce himself the actions referred to in the words *he rings the bell, I rub my eyes, I sleep, I wake up, he gets dressed*, etc., etc.

"Many exercises may be connected at once with the very first dialogue. The verbs *to see, to put on, to put away, to pick up*, may be introduced into sentences by the class, *e.g., I see the sponge, the brush, the comb;* according to the teacher's directions the boys may go through the actions, *I pick up the sponge, I put away the sponge*, while they utter at the same time the appropriate words. One of the boys may then assume the part of the master, and give similar directions to his class-fellows; and thus from the very first the subject may be constantly manipulated and brought under the control of the class. These brief examples show the possibility of connecting objects and words in the foreign tongue from the very first; and even in cases where the German language is employed to make the meaning clear to the pupils it retires immediately to allow English to come to the front.

"Dr. Hausknecht concludes Sketch I, with a series of questions, based on the matter contained in it, in order that the pupils may at once become familiar with the process of framing questions. In connection with these the pupils can

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* This word really represents 'Anschauung': it has hitherto been a technical term of philosophy in English but is now becoming more familiar as a useful expression in discussing educational methods.

at once proceed in the next lesson to form questions themselves and invite their class-fellows to answer them. It may in general be recommended that the very first time a passage is read, sentence by sentence it should be repeated and made the matter of questions. When phonetic texts are available, the first process of dealing with them will be rapidly completed, the books may then be closed, and the teacher may proceed to read the passage; otherwise, when the book is printed with the usual orthography, before he reads it, the passage must undergo a long and careful oral examination, and this explanation must be thoroughly grasped.

"The pupils are probably familiar, through their French lessons, with the process of multiplying individual sentences by framing questions on them; so this process may begin at once in the case of English. After the teacher has pointed out the subject in each sentence by means of *who* or *what*, the same questions may be repeated by the pupils; after this, questions may be formed regarding the object, with *whom* or *what*, then other questions with the adverbs *where* or *when*. It will be found very useful to extend the scheme of such questions in accordance with the matter of successive dialogues. Each sentence offers opportunities for a very great variety of questions. Let us take, for instance, the following sentence in the second dialogue: *Mr. James, the English master, enters the room.* The pupil may construct the following questions: *Who enters the room? Who is Mr. James? What does he enter?*

"Moreover, the pupils may be practised in catching the meaning of new sentences; and after they have heard these several times they may repeat them themselves. The teacher may often say *sit down, stand up, shut the books, open the books, shut the door, open the door, go to the blackboard, take the chalk, rub out what you have written;* then the pupils may not only perform these actions (which in the first instance, was the object of the order,) but they may also learn to say, as they do so, *I am sitting down. I take the chalk,* etc., etc.

"Our object is to make the class stimulate each other, and we may do this, and at the same time practise the conjugation of verbs; thus, one boy may say as he sits down, *I am sitting down;* another may add, addressing him, *You are sitting down;* while a third continues *He is sitting down.*

"To extend the control over the verbs, they may be manipulated in the three tenses. Dr. Hausknecht has provided exercises for this purpose, based on an inductive treatment of grammar. Thus a boy may be directed to perform the following actions, and accompany them with words: *I shall leave my place, I am leaving my place, I have left my place; I shall go to the door, I am going to the door, I have gone to the door.*

"In connection with this another boy may be required to co-operate as explained above; all this has the advantage of bringing expression into close connection with action.

"As the pupils' vocabulary increases they may be required to express any action which proceeds or is performed by themselves, in the class room.

"The following examples will illustrate these exercises. When a day's work begins, a few moments are occupied by preparations on the part of the teacher; these may be utilized by the class, either singly or simultaneously, describing aloud each of his actions as it takes place.

"To effect this, the teacher first describes the action himself. As he enters the room he says, *I am entering the room.* The boys continue, *You are entering the room.* Teacher, *I am stepping on to the platform.* Boys, *You are stepping on to the platform.* Then the boys may continue spontaneously, *You are pushing back your chair, you are sitting down, you are opening the inkstand, you are taking the pen, you are dipping it into the inkstand, you are opening the class-book, you are turning over the leaves, you are writing your name, you are putting down the pen, you are shutting the class-book, you are putting it away and you are standing up, you are getting down from the platform, you are going up to the class.*

"As the teacher makes his entries in the class-book, he asks, *Is there anybody absent?* and the answer comes, *Yes, Sir, W. is absent,* or *No, Sir, there is nobody absent.* The boys may reply in turn, or simultaneously, or according as they are called on by the teacher. It will be found that the teacher may be spared much talking, and the attention of the boys very well kept alive by the practice of indicating a boy by a glance without naming him. Of course this exercise does not continue long. Immediately afterwards one of the boys may write down the day's work on the B. B.; or if it happens to be anyone's birthday he may mention it to the class, using some such expression as this, *To-day is my birthday. I was born on May 6th, 1887.* The teacher then congratulates him; he introduces expressions appropriate for this purpose, perhaps accompanied with a little advice; and the episode serves as well to please the boys, to increase their affection for their work, and to bring teacher and taught close together. In order not to lose a moment of time, I sometimes call out one of the boys, while I am engaged with my own preparations, and make him question the class on a given part of their past work.

"Immediate intuition of objects offers many opportunities for practice in conversation, so that the pupils learn at once to observe closely and to put into words what they have observed. In our mother tongue we express without reflection what we have seen and heard; so in the same way we must learn in the foreign tongue to express ourselves by the aid of reflection.

"In dealing with the matter of our reader we try to connect it with our daily life; we pass away from objects directly visible; we artificially extend the matter provided, and create situations which force us to express what we are doing.

"We may observe how children talk to each other, and employ the result as a finger-post to guide us. As they proceed under natural circumstances, so we may proceed in a wider sphere, to increase the power of expression, to create for them the necessity of clothing in words all that they see or hear or think. Thus, we may pass on to questions founded on the recitation of some poem, dialogue, or tale, or may require individual sentences to be repeated or imitated; we may set the boys to transfer situations from one country to another (*e.g.*, the situations

of school-life) and thus we may devise endless exercises, which I have already partly described, but may here illustrate more fully. *E.g.*, the teacher may require the pupils to form sentences with prepositions—

(*a*) from the objects directly in front of them :—

*I am in one of our school-rooms.*
*I am sitting on a form between C. and D.*
*C. is sitting beside me.*
*My friend B. is above me in the class.*
*These books belong to me.*
*They are lying under the desk.*
*My seat is near the door.*
*I am sitting under the lamp.*
*The walls are round us.*

(*b*) dealing with actions performed by others :—

*B. walk up to the desk.*
*C. stand before B.*
*E. stand to my right.*
*Who is standing in front of B.?*
*Who is standing between C. and D.?*

(*c*) dealing with actions performed by the pupil : —

*I am coming from the playground.*
*I am going through the corridor.*
*I am going towards the door.*
*I am stopping before the door.*
*I am joining my friends at the door.*
*I am standing on the threshold.*
*I am going into the room.*
*I am in the room.*
*I am sitting down on the form amid the boys.*
*I am looking out of the window.*
*I am looking over my shoulder.*
*I am looking up to the ceiling.*
*I am looking for my pencil.*
*I am looking behind the desk.*
*I am looking in my pocket-book.*
*I am looking into the inkpot.*
*I am looking through my fingers.*
*I am looking at my master.*
*I am looking after my work.*

I may conclude this extract from Direktor Walter's book by reprinting an example which he gives of the power of manipulating sentences acquired by his pupils a little later on. The sentence placed before the boys was *The advantage of the English ships lay not in bulk but in construction.* The following paraphrases were then written down by them :—

(i) The English were overwhelming not by the size of their ships, but their power lay in the construction of their ships.

(ii) In construction, not in bulk, lay the advantage of the English ships.
(iii) The English ships were superior to the Spanish, not in bulk but in construction.
(iv) The advantage of the English squadron consisted not in bulk but in construction.
(v) The advantage of the English was the light construction of their ships.
(vi) The English had not large vessels, but they were better constructed.
(vii) The power of the vessels of the English was not caused by the extent but by the construction of their ships.
(viii) The English men-of-war could do very much against the enemy, because they were well constructed and not too large.
(ix) The English vessels were not large, but well-constructed.
(x) The advantage of the English men-of-war did not consist in size, but in construction.
(xi) The advantage of the English men-of-war was to be found in their construction.

I have now reproduced enough to show how lively and practical is Direktor Walter's book. Those who read this extract cannot, unfortunately, like myself, accompany it with an image of his vigorous and genial personality. But they will appreciate its value, and will perhaps agree with me that if it be desired to introduce the Direct Method into Indian schools, no better hand-book could be provided than a translation of *Englisch nach dem Frankfurter Reform-Plan*.

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## APPENDIX E.

It may be worth while to bring specially before the notice of the Indian reader a grammar which has come into my hands since the body of this report was written, by Dr. Konrad Meier, of the Drei-Kōnig-Schule, Dresden. It is remarkable for its consistent treatment of syntax according to the principles of the Direct Method. The rules of syntax are explained throughout as rules according to which language is used for the purpose of expressing a given idea; and the ideas are classified according to the relations between objects which they represent. The system will be better understood from a perusal of an extract from the treatment of Prepositions (Section VII, 189). (The parts of the passage printed in heavy type are translations from German; the rest is, in the original, English.)

### A.—Relations of Place—where rest is implied.

**I. The position of an object coincides with the place mentioned.**

**(i) The position is a point. Preposition *at*.**

**at the corner, at the door, at the window, at table, at school, at church, at the theatre, at sea,**

at the head, at the top, at the bottom,
at the mouth, at the source (spring) of a river,
at ten feet distance, at a distance of several miles,
at my feet, at one's post, at a ball, at a concert,
to stop at an inn, to dine at one's friend's,
to land at a bridge, to be born at Manchester.

(ii) **The position is on a certain tract or limited surface. Preposition,** *on, upon.*

on a river, on the coast, on the road.
etc., etc., etc.

(iii) **The position is somewhere in the neighbourhood of a place mentioned. Preposition** *about.*

I have no money about me.
etc., etc., etc.

(iv) **The position is within a space or body (of three dimensions) or an unlimited surface. Preposition** *in.*

in the sky, in the room, in the air, in the water.
etc., etc., etc., etc.

**II. The position of an object is at a distance from the place mentioned.**

(i) **It is merely removed from it. Preposition** *off, from.*

off the coast of Ireland; two miles off (from) the town
etc., etc., etc., etc.

(ii) **The distance is great. Preposition** *far (away) from, far off.*

far from here,
far from thinking.
etc., etc., etc.

The treatment is continued throughout some pages. Relations of Place are succeeded by Relations of Motion, of Material, of Association, of Time, of Agency. A little translation is very occasionally introduced.

## APPENDIX F.

### Readers and Text-books in actual use, 1903-1904.*

### O. I.

(i) *Die Musterschule, Frankfort.*—Shakespeare, Julius Cæsar, Coriolanus; Smith, A Trip to England; Macaulay, History of England, Ch. I.

(ii) *Oberrealschule, Holstentor, Hamburg.*—Gardiner, Historical Biographies; Dickens, Christmas Carol; Macaulay, Lord Clive. Essay: The Beginning of English Supremacy on Sea; Religion as a Motive of Colonisation; Analysis of the first part of Burke's Speech on the East India Bill, etc.

* The list of works read will appear surprisingly long, but (i) there are usually divisions in each class, which may have read different books; (ii) the works indicated have in many cases only been read in portions, but the portions are not specified in the school reports. In some cases the essays done are specified, and I have added them.

(iii) *Reform Realgymasium, Kiel.*—Poetry (Milton, Pope, Gray, Thomson, Burns, Byron, Scott, etc., etc.)

(iv) *Oberrealschule, Cassel.*—Richard II; Miscellaneous selections from Herrig's Chrestomathien. Essays: The Prisoner of Chillon; Sir R. Arkwright; Hamlet's Soliloquy, etc.

U. I.

* (i) Scott, Lady of the Lake. Green, England under George III. Tennyson, Enoch Arden.

(ii) Fyfe, History of Commerce. Jespersen, The England and America Reader. Shakespeare, Richard III. Seeley, Expansion of England. Dickens, Christmas Carol. Essays: Phases in the Development of Great Britain; Merchant Princes of the Middle Ages; The Origin of the English Drama, etc.

(iii) Poetical and other extracts.

(iv) Extracts from Herrig. Poetry and prose (Robertson, Defoe, Swift, Dickens, Shakespeare, Thackeray, etc.) Essay: Mary Stuart's Last Day, etc.

O. II.

(i) Masterpieces of Macaulay (in the Neu-Sprachliche Reform-Bibliothek).

(ii) Kirkman, The Growth of Greater Britain. Similar essays.

(iii) 'Compositions' in Hausknecht's *English Student.*

(iv) Extracts from Herrig. Passages from Dubislav and Boek's Reader.

U. II.

(i) 'Compositions' from Hausknecht's *English Student.*

(ii) Not specified.

(iii) Hausknecht's *English Student.*

(iv) Dubislav and Boek's Reader.

O. III.

(i) (No English.)

(ii) Dubislav and Boek.

(iii) (No English.)

(iv) F. Schmidt's Reader; Dubislav and Boek.

U. III.

(ii) Dubislav and Boek.

(iv) F. Schmidt's Reader.

## APPENDIX G.

## List of Books of Reference.

### I. GERMAN.

(*a*) School-Books.

*Kurzgefasstes Lehr- und Uebungsbuch der englischen Sprache.*—(A Short book for Instruction and Practice in English). Dubislav and Boek. Second edition, 1903. Published by Weidmann, Berlin.

* The schools follow each other in the same order under each class.

*Lehr- und Lesebuch der englischen Sprache.* (Instruction and Reading-book in English.) A. Schwieker. Eighth edition, 1900. Published by O. Meissner, Hamburg.

*Englisches Lese- und Realien-Buch.* (An English-Reading book containing a description of English life.) J. Klapperich. Published by Velhasen and Klasing, 1904.

*The English Student.* E. Hausknecht. Seventh edition, 1903. Published by Wiegandt and Grieben, Berlin.

*Englisches Lese- und Uebungsbuch für Realanstalten.* (English Reading and Practice for Real-institutions. Vietor and Dörr. Seventh edition, 1904. B. S. Teubner, Leipzig. The new edition will be known as a Special Edition (Sonderausgabe). Vietor and Dörr.

*Englisches Sprachstoff nach der Grundsatzen F. Gouins.* (Materials for English Conversation according to Gouin's principles.) By Höft. Third edition, 1904. Published by O. Meissner, Hamburg.

*Die Serien Methode.* (A Guide to the use of the above.) By the same author.

A useful catalogue of school-books can be obtained from Theodor Fröhlich's book-shop, Berlin.

(*b*) Method.

*Englisch nach dem Frankfurter Reform-Plan.* (English on the Frankfort Reform-Plan.) M. Walter, 1900. Published by N. G. Elwert, Marburg.

*Anleitung zum französischen und englischen Unterricht.* (Introduction to French and English Teaching). L. Spies. Velhasen and Klasing, Leipzig.

## II. English.

(*a*) Method.

*The Art of Studying and Teaching Languages.* F. Gouin. Translated by Swan and Betis. Published by G. Philip, London, Sixth edition.

*A First English Book for Boys whose Mother Tongue is not English.* W. Rippmann, 1904. Published by J. M. Dent, London.

(*b*) Phonetics.

*Elements of Phonetics.* W. Rippmann. Published by J. M. Dent, London.

*Introduction to Phonetics.* L. Soames. Published by Swan, Sonnenschein & Co., London.

(*c*) Publications of the English Board of Education concerning Education in Germany :—

*The Teaching of Modern Languages in Frankfurt on Main and District.* F. Ware.

*The Teaching of Modern Languages in Germany.* M. Grebner.

*The Teaching of Foreign Languages.* E. Hausknecht. Translated by H. W. Atkinson.

# II.—EDUCATIONAL STUDIES AT THE ST. LOUIS EXPOSITION.

BY

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THE following pages are selected from some studies of the St. Louis Exposition by Mr. H. Sharp, late Inspector of Schools in the Central Provinces and now Director of Public Instruction in Eastern Bengal and Assam. Mr. Sharp was sent to St. Louis in May 1904 with a general commission to visit the Exposition, to attend the meetings of the National Educational Association, and to describe whatever should appear to him of most interest as bearing, by way of comparison, on Indian Education; and he remained there fifty-five days.

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# EDUCATIONAL STUDIES AT THE ST. LOUIS EXPOSITION.

## Section I.—NATURAL METHODS IN SCIENCE, GEOGRAPHY AND HISTORY.*

The meaning of natural methods.

1. *Ars est homo additus naturæ.* The art of teaching is the application by the teacher of the ways of nature. Such is the modern doctrine of pedagogy. But, like so many new doctrines, it may be made to mean too much. In some respects it has not been pressed to its logical conclusions; in others, it has caused the pendulum to swing back too violently. A crusade has been initiated against the imparting of knowledge. Yet the dictum "That only is knowledge which a child can find out for itself" is, on the face of it, untenable. A child may, it is true, in a sense discover the circumference of the earth by measuring a globe with a tape and comparing the tape with a scale. But he cannot, even in this limited sense, discover that the sun is ninety-five millions of miles distant from the earth; and yet it will hardly be denied that this

* I had fixed upon the title and plan of this section before I became acquainted with Mr. J. Swett's "American Public Schools." The name was not suggested by the titles of Chapters IX and X of that book; and the ideas are a direct result of the teachings of the Exposition. Nevertheless I am indebted to Mr. Swett for several side-lights and numerous felicitous expressions. His volume is most valuable in studying American methods.

is an interesting and suggestive, even if not a directly useful, piece of knowledge. Again, a child cannot, without being told, know that a certain constellation of stars is called Orion's Belt; yet the fact has æsthetic and literary value. Those truths which lie outside the realm of ordinary observation and experiment must perforce be imparted. Where the natural method steps in is in the imparting of such truths in a way which shall naturally appeal to the child, so that he shall assimilate them, appreciate them, and remember them. Thus, the distance of the sun may be impressed upon the child's mind by constant repetition (which the slightest knowledge of child-study will show to be one of nature's most favourite methods with children*); by comparison with other distances which are known; by that emphdsis which can be secured through the mere elimination of the mass of unnecessary details, with which, as with choking weeds, geography books and geography teachers are apt to overburden the youthful mind. Again, the child will be interested in Orion's Belt, will remember the name and be able to point out the stars, if the constellation is shown him several times in different positions, if he is told the story of Orion, if he is bidden to draw the stars on paper and delineate the figure of Orion round them. In the early stages of education, facts must be acquired from the book or from oral instruction; often they must be memorised. The Jesuits were wrong when they promoted those teachers who were successful with the higher classes to the instruction of the lowest. The art of child-teaching is a subtle one, in some respects more difficult than that of adult-teaching. (This is now fully recognised in the careful training of kindergartners.) But the elementary teacher requires knowledge less wide, and power other than that of the secondary teacher. The methods of the former must be dogmatic; those of the latter suggestive. The child's observation must be cultivated; but so also must his memory. He must acquire the groundwork of facts which, in the high school, he will learn to arrange. Now the acquisition of facts is generally regarded as a dull and difficult task for a child.

* Science and Art of Education, by J. Payne, page 12 (new edition of the Educational Publishing Company, Boston, 1892).

This is so only when the child's whole soul is not summoned to the task; when his eye and his ear are tied down to the book and the spoken word; when his mind is left to do the rest. In this way the natural channels for knowledge fall into disuse; untimely strain is placed upon memory and the reflective faculty. It has been said that instruction should no longer be in the "3 R's," but through the "3 H's" (head, hand and heart). It is possible to go further and to assert that it must be through every faculty and activity which the child possesses—and that in their right order of development. Sensation and expression come into being before reflexion. Sensation offers the widest avenues to knowledge, if the child be taught to observe, to acquire facts through concrete illustrations. Expression facilitates impression; it is the imitative sense *plus* the love of creating; it can be cultivated through encouragement to narrate that which has been acquired, by word of mouth, by writing, by delineation.

Natural methods illustrated in the Exposition.

2. It has been remarked that a striking characteristic of the St. Louis Exposition was the similarity of methods which the Educational Exhibit disclosed. This similarity manifested itself between the different States of the Union, and (to a lesser degree) between them and foreign countries. Nothing impressed me so strongly as this homogeneity of method among communities independently administered, and separated from each other by the vast distances of North America. Where the United States exhibits preponderated so largely, the impression made by their methods was naturally deeper. Moreover, the Americans have brought a freshness and a vigour which are characteristic of them to the task of pressing home the doctrine of natural methods to its logical conclusion. I propose, therefore, to treat of this subject as illustrated in all the chief exhibits, but especially in those of the United States. The subject will not necessarily be confined to elementary periods of instruction (it must be remembered that "elementary" is a vague term, denoting, in America, the first eight or nine years of education); references will occasionally be made to high schools; but the period touched upon may generally be taken as extending from the age of seven to that of sixteen.

The courses chosen for illustration are those of science, geography and history. These subjects run a special risk of being taught unnaturally, because the teacher expends upon them less time and pains than on language, mathematics, etc.; they are regarded as "*parerga.*" Secondly, they are concrete subjects (*Realien*), in which the acquisition of facts is specially prominent. Finally, they offer a most useful field of discussion, because it is in them that the teacher most needs, and most seldom receives, advice and sympathy. It is so easy to find fault with a master whose boys can reel off lists of towns and provinces, about which they know nothing and care less. But it is worse than useless to the master; it is discouraging to him. He has taken some trouble to cram these useless "facts" into the boys; and to be told that facts are not to be taught both maddens and misleads him. It is more profitable to show him that facts are not mere words, that facts (in the proper sense of the term) must be acquired, and the method of instilling them.

**The principles involved in natural methods.**

3. What then are the general principles to be adopted in teaching these subjects? Speaking broadly, instruction must be stripped of its formality and made to approximate to the lessons of nature. It is easy enough to recall the pleasure, the freshness and the indelibility of our early, unconscious education among the flowers of the field, by hills and streams, or when we sat in the winter firelight listening to some reading or narrative of romance. It is equally easy to remember the dulness, the drudgery and the fruitless efforts of recollection entailed in an early study of the same subjects when treated in a formal and "bookish" manner. The latter method failed to effect what the former accomplished—namely, the concentration of all our faculties on the subject in hand; the correlation of new facts with others stored in our mind, resulting in the vivid imaginings of childhood; the expression, finally, of those imaginings by means of spontaneous story-telling, "scribbling" and construction. First, then, the acquisition of facts must be through many and easy channels. It must be objective, depending, as far as possible, upon observation and experiment; the pupil must re-discover some facts of nature in

order to discover any. It must likewise be visual, depending, when the limits of experience are exceeded, on illustration by picture, photograph, map, plan and lantern. It must be largely oral, because hearing is easier in the early stages than reading; because the speaker, unlike the book, can be questioned; because at certain periods a topical and eclective treatment is better than a set text-book. Second, in order that the facts acquired may not hang in air, but may connect themselves with various points of interest to the child, they must be correlated both with activities and with other subjects. This system, however, should not be over-done, else it becomes forced and puerile; many Americans are not in favour of the elaborate studies of West Indian life introduced into some schools, where the construction of model wigwams, canoes and other savage paraphernalia form a central theme. Correlation of subjects, on the other hand, appears to be an unqualified good. It is not necessary that the portions of different subjects studied in the same week should fit one into another (though this, too, may to some extent be practised with advantage). But one subject, as a whole, may be made to lead up to and illustrate another, till, in some of their aspects, science, geography and history form almost one continuous branch of study. Third, the child must be given free scope for expressing that which he has learned. This imitative activity is pleasurable; and the practice of it conduces to strong and vivid impressions, and to a habit of taking pride in the neatness of the work executed. This expression finds vent in three principal ways. First, in narrative; not only in America, but in Germany and France as well, the plan of making a pupil stand up and re-construct in his own words that which he has heard finds considerable favour. Next, in writing; the American pupil is frequently called upon to write down a little essay in school upon what he has just heard; the exhibits were full of specimens of this work, which were wonderfully neat and often full of originality of thought and expression. Freedom of treatment is an important condition in exercises of this nature. Finally, in drawing; perhaps no single trait of the whole exhibit was so striking as the importance attached (both in English and in American

schools) to drawing as an auxiliary to every other branch of study. The essays just referred to were almost always illustrated with rapid sketches, with rough maps, with plans, with diagrams. In the higher classes, the note-books contained careful work of a high order in the way of pictures, sections, etc. When the geographical or historical subjects are too complicated for illustration by amateurs, wood-cuts and reproductions of photographs are cut out of periodicals by the children, and neatly pasted in appropriate places in their essay-books.

Application of these principles.

4. Such being the general principles, let us see how they were worked out in detail in the exhibits dealing with science, geography and history in elementary and secondary schools. It will be convenient to divide each of these subjects into three stages—the primary, the higher primary (answering to the grammar grades of American schools) and the high. The last, however, will be dealt with very briefly, since the high school pupil approximates to the adult, and the methods of instruction brought to bear on him are consequently different.

I. In Science. First stage. (*a*) Kindergarten methods.

5. I. The preliminary stage in science presents three problems—(*a*) kindergarten methods (which largely deal with a kind of elementary science), (*b*) object-lessons, and (*c*) nature study. (*a*) The kindergarten class has received in America a wide extension and a healthy development. Yet this has not been done without some misgivings. It has been felt that the doing by children of what they like to do is not a complete training of character; that there is often a tendency towards sentimentalism about the system; that the method is apt to degenerate into a mere organised game rather than to form an introduction to serious study; that, finally, its abrupt cessation is likely to render its teachings nugatory. So far as I could judge from the exhibits and from what I saw of elementary schools, the grounds for these suspicions have been removed. First, kindergarten instruction is made a foundation for the various branches of study; it is not an independent subject. Thus in the exhibit of the School Board for London, a course is mapped out for infants of from five to six years of age:—

The story of the months.

The positions of the sun ; the compass ; the constellations.
Memory drawing (for girls, pricking and sewing) of horse-shoe, cow's foot, pick-axe, leaf, etc.

These are correlated with special subjects for reading, spelling and dictation lessons and so forth, with constant correlation with the elements of the subjects to be studied later. Second, kindergarten methods do not suddenly give way to serious forms of study. The breach is made gradually ; the Fröbelian system is rightly carried up above the first grades; but the elder children are not treated as infants ; their self-activity continues ; but it is constrained and related ever more and more closely to the subjects in hand.

(*b*) Object lessons.

6. (*b*) Object lessons still hold their own in England. In America these lessons appear to be delivered in the less formal (and perhaps preferable) manner presently to be described (paragraph 7). As regards their value in India, I can only repeat what I have already said on the subject*—that an undisguised object-lesson in the hands of a native teacher is almost always a failure. My opinion is not weakened by a perusal of Volume VIII of the Special Reports on Educational Subjects (Board of Education, Whitehall), in which a Malayan master is described as delivering a lesson on the frog with the aid of snail's spawn, a tadpole and a toad as illustrative objects.

(*c*) Nature study.

7. (*c*) Nature study, again, is still a vexed question. While it is admitted that this study is simply the training of the eye, the development of the power of observation, yet, in its application, the term is made to bear a whole gamut of meanings, from namby-pamby sentimentality to formal science.† The exhibit contained numerous specimens of, and books upon, nature study ; yet, in nearly every case, the subject was natural history. Thus, in the British exhibit, there were a number of note-books from the Haworth Central School, containing dried specimens of flowers collected during walks ; yet the work was obviously botany. Liverpool

* "Rural Schools in the Central Provinces" (being No. 1 of Occasional Reports in the Office of the Director-General of Education in India), page 55.

† A full and very amusing analysis of nature study as understood in America is to be found in Special Reports on Educational Subjects (Board of Education, Whitehall, Vol. II).

displayed an elaborate scheme for nature study and instructions for rambles, whereas a ramble should surely, in its essence, be unpremeditated. There were numbers of German books on the subject; but they, too, always appeared to deal with natural history. Hundreds of note-books illustrated the methods adopted in America, which appear to be a mixture of those employed in object-lessons and in informal botany, zoology, etc. In a word, the exhibit appeared to me to demonstrate the fact that nature study, in the strict sense of the term, does not and cannot exist as a separate portion of school work. To demand it of the master is indeed to ask for form without matter. Yet, in America especially, a very useful imitation is in vogue. This is simply the delivery of very informal lessons in natural history and science, illustrated by objects, walks and excursions, and reproduced by the pupils in the form of little essays accompanied by pencil or water-colour sketches. A plan of such lessons is to be found in Swett's "American Public Schools," pages 280 to 283. In order that these lessons may be a success, the following points among others must be observed:—

(1) The master must arouse enthusiasm in himself and his pupils.

(2) Though the work chiefly takes place in the class room, it must be supplemented by walks and excursions; teacher and pupil alike must adopt the ways of a naturalist.

(3) The groups of subjects taken up must be numerous, so as to supply a broad foundation for the subsequent study of science. But it is a good sign when a master (or a school) specialises in, without confining himself to, a single group. As a rule, the study of plants should come first, that of nimals next, etc.

(4) The teaching must be quite informal; and the children, at least, should have no text-books. The lines of least resistance should be followed; thus, a child is interested in a plant as a whole before he is interested in its parts. Hence, the earliest lesson should deal with various plants, considered generally, the children's exercises taking the form of imaginary stories, or broad descriptions.

(5) The children must be encouraged to use profuse illustrations in their essays.

This mode of teaching science in the primary and grammar grades may appear desultory and objectless. But this is not borne out by subsequent work. Not only is a broad basis established in the child's mind for the study of formal physiology, botany, zoology, physics and chemistry, in the high school; but, even if the pupil's education ceases with the elementary course, he has still reaped two great benefits. First, his power of observation has been quickened. Second, the method adopted has forestalled nature in opening his eyes to some of the simple, but vastly suggestive, facts around him. That he should some day (and to a greater or less degree) awake to these facts is inevitable; that he should do so early is of immeasurable gain. It means that, while the mind is still receptive and the senses undulled, while the child still inherits the priceless (but often wasted) gift of leisure, he is set upon right tracks, he is placed at various starting points, whence the elastic step of youth cannot but press on with pleasure, haste and wonder down avenues of beauty and knowledge, which, had they been opened to him in later years, he would not have found the time, the fresh interest, or the eager longing to explore.

Second stage.

8. The preceding paragraph, though it began with nature study, has carried us to the second stage (that of the grammar grades) in American schools, for the simple reason that an examination of numerous exhibits of the kind convinced me that there is no differentiation between the methods pursued in the primary and grammar grades respectively. The commencement of formal science is postponed till the pupil enters the high school at the age of fourteen or fifteen. This postponement is regretted by many thinking Americans, who regard with envy the earlier commencement which is made in English schools. While there is much to be said for the American system, yet England stands unrivalled for solid, common-sense instruction in science throughout her primary and lower secondary schools, albeit their equipment is generally inferior. A comparison of particular examples will show the difference between the discursive, intuitive method pursued in

America and the more intensive system adopted in England. The elementary science scheme of the Fortress Road Junior Boys' School, Kentish Town, offers an admirable type, worthy of imitation. But, even with reference to such a scheme, it should be remembered that elementary methods must not abruptly give way to formal study. The use of the text-book should be discouraged till a comparatively late stage; instruction must be largely oral. Moreover, it must be topical; the study of a complicated phenomenon, such as the burning of a candle, may profitably occupy not a few lessons, illustrating as it does, the elementary and fundamental truths of mechanics, heat, light and chemistry, and affording an interesting and easy starting point for the study of all or any of these sciences. Again, the lesson or recitation is not sufficient; laboratory methods should be insisted on (within proper limits) from the beginning; the pupil must feel that the work is his. Correlation with other subjects, such as mathematics on the one hand and manual training on the other, must be emphasised whenever opportunity admits; it is a good plan for boys to construct in the carpenter's shop the simpler pieces of apparatus (such as stands and racks) required for experiment; later on, mechanics may be illustrated by the making in wood of patterns of simple engines and machines. Finally, expression must be encouraged by the writing of careful notes and themes illustrated with neat sketches and plans.

Third stage. (1) The logical method.

9. (1) In the high school, the natural devices which have sweetened the study of science to the child are largely discarded. But even when the subjects have become admittedly formal objective instruction, correlation and expression cannot be abandoned. It must suffice to consider the proper methods briefly in two connexions. (1) The proper goal of science must not be forgotten; it is to foster habits of thoughtful observation, to open up new fields of interest in everyday life, to construct in the mind a proper understanding and appreciation of the world around us. "The right kind of nature study, as it is attempted in our higher educational institutions," says Herr Norrenberg, "naturally produces a development of the mental powers; it ennobles soul and mind by a recognition of the all-directing, eternal and inexorable principle of

law, to which even our own actions must bend, which sets limits even to our free will; it produces in us a refined appreciation of the beautiful, as universally manifested in the wide world, not only in wood and field but also in the laboratory. Scientific instruction is second to no other subject of education in its logical, ethical and æsthetic effect."* Such is the place of science in the broad, truly educative scheme of German education. A highly industrial civilisation tends, in the higher grades, to substitute utilitarian for educative ends. In no branch so much as in science is this felt. And the aim naturally dictates the method. Yet in America, as well as in Germany, there is an outcry among educationalists against commercial methods of science teaching. What is the use (I have heard it asked) to teach a boy how to calculate the resistance of a wire? He can do that from looking at a Table. He must rather get thoughts and learn to reflect. Commercial ends should be attained by commercial (not by pseudo-scientific) means. Such opinions emphasise the need of strictly logical methods in teaching science, and suggest one special point which is generally neglected, but which it would be well to adopt, in the high schools of all countries. I mean some grounding in the methods of science. It is true that a pupil whose habit of mind is particularly logical will imbibe from his ordinary studies something of this subject. But, even in his case, the knowledge remains sub-conscious; and, in the majority of cases, it will never be produced save by suggestion or even direct demonstration. How many boys flounder through biology and physics without ever realising the insufficiency (for purposes of induction) of a single instance in the one, its potent value in the other?

10. (2) The necessity of laboratory methods is too universally recognised to require more than brief comment here. I noticed particularly an experimental science scheme for a higher grade girls' school in the British Exhibit, which appeared interesting as similar, and yet superior, to certain schemes which have recently been adopted in some high schools in India. Secondly, an account of an experiment from the note-book of a Christ's Hospital pupil (also in

(2) The laboratory method.

* Translated from "*Die Reform des höheren Schulwesens in Preussen*," page 288.

the British Exhibit) seemed an extraordinary specimen of laboratory (combined with logical) method as pushed to the extreme limit. It shows what can be done by way of re-discovery without the aid of lecture or text-book. Some supervision was doubtless necessary; yet, even so, this note-book (of a boy beginning the formal study of chemistry) appeared to me one of the most astounding items in the whole exhibit. Finally, a word of warning is added. Experiments should not be trivial; nor should the time of pupils be wasted in performing experiments the full benefit of which could be reaped by watching the instructor make them. Above all, apparatus in high schools should be simple and strictly subordinated to the ends of instruction. Theatrical displays are all very well in a general lecture out of school hours; and a list of elaborate equipment reads well in the prospectus of a school applying for recognition. But an electric machine is useless unless demonstrations have previously been given with the electrophorus; and the air-pump and the microscope are more valuable in secondary schools than Geissler tubes or an X-ray installation.

**II. In Geography. First stage.**

11. II. Not much in the way of geography can be attempted in infant classes. Kindergarten occupations may be correlated with simple geographical ideas. Early lessons in nature study are often really geography lessons. Talks to children about the stars, useful plants, wind, rain, industries, rivers, railroads, races of men, form a most appropriate introduction to the study of this subject. A formal beginning may even be made by the teaching of *Heimatkunde*, which is a much easier matter to deal with than are nature study and object-lessons (if for no other reason than that here the objects are always to hand); and it has been introduced, not without success, into some schools of India.

**Second stage.**

12. Difficulties, however, commence with the second stage. The formal study of geography naturally begins earlier in the school career than does that of science. And formal geography always has been, and to a large extent must still remain, regional. For the child cannot learn about the world without studying its different parts. Now regional geography quickly degenerates into the memorising of words without the assimilation of facts or the

formation of ideas. But the Education Exhibit sufficiently shows how this difficulty is surmounted. There appears to be no reason why its teachings should not be successfully applied in the educational system of any country whatever. Financial and local peculiarities may entail modifications; but the main principle can still be adopted; this principle consists in the ingenious treatment of each region dealt with (1) externally as a portion of the whole, (2) internally by a topical method gradually worked down to narrower and still narrower regional limits. Let us consider how practical effect is given to this idea.

(1) Connexion with preliminary studies.

13. (1) The transition from preliminary studies to formal regional geography must not be too abrupt. Under preliminary studies may be grouped those elementary lessons in geography which can be conducted by pointing out to the pupils the very objects of which they treat—a little astronomical geography, simple physiography and *Heimatkunde*. To take the last as an example:—After drawing the attention of the children to their own houses and to the school-room, to furniture and common utensils, after showing them the meaning of plans and maps, after making them conversant with the topography of the village or town in which they dwell, it is useless to carry them straight on to the description of their country, their province, or even their district or county. A transition stage is required, in which they may get a grasp of proportions in distance, of the meaning of a city as compared with a village, of the significance of roads, railroads, etc. Instead, then, of launching them into a wilderness of boundaries, towns, rivers, etc., we should transport them in imagination to one or two neighbouring villages, the salient features of which, their distance from, and connexion with their own dwelling place, should be shown. They should be questioned as to their own experience of a railway journey, or (with the aid of the map) taken for an imaginary trip to a neighbouring town and learn something about its characteristics.

(2) Text books.

14. (2) American geography books are a revelation. The best are by Redway and Hinman and by Frye (see Bibliography). Unfortunately, any book compiled on these lines must be costly;

but the inclusion of a single copy of these works in an English School Library in India and its perusal by the masters would be a valuable training. To be appreciated these books must be seen; for it is on their informal style, their suggestive mingling of questions with statements, their "map-studies" (a truly Socratic method), their profusion of good illustrations, maps (especially beautiful relief maps) and plans, that their value depends. The old-fashioned geography book was a bugbear; such volumes as these must be a never ceasing source of joy to the children. A faint idea of the method pursued may be gathered from a sketch of the contents of Frye's "Primary Geography." The first section is entitled "Home Geography"; it gives an enumeration of the different parts of land and water. Needless to say, there are no formal definitions; all is done by way of picture, actual observation and comparison. Simple explanations are given as to how mountains, rivers, plains, etc., are formed. The section ends appropriately with the points of the compass, and the meaning of maps. A portion of one paragraph is worth quotation:—

*How maps are made.*

How long is the top of your desk? How wide is it?

Draw the top of your desk, making the drawing one-eighth as long as the desk.

How long is the school-room? How wide is it?

Draw the sides and ends of the floor. Let one half of an inch on the paper stand for one yard on the floor. Put all the desk-tops in the drawing.

This picture of a school-room will show you how to draw yours (a plan is shown).

Draw the room again, and let one-eighth of an inch stand for one foot. Mark windows and doors.

And so on. The second section is a description of the earth as a whole, its shape, size (this is one of the very few instances where numbers occur in the book), composition, atmosphere, etc. Next, the slopes of the earth (the world ridge and the chief mountain ranges) are described, largely by means of relief maps; the great

plains and oceans are also indicated. The next six sections deal with the six great land divisions of the world, treated topically with reference to their surface, interesting pieces of information being intermixed. Thus Asia is described in four pages, more than one half of which is map and picture. We are informed that Asia is the largest of the divisions; its area is not stated, only compared with that of America. The central plateau and the Himalayas are briefly described, the height of the mountains being given in miles, not feet. "Map-studies" follow; then a description of the Arctic slope and *tundras*, which leads on to a few words about the beaver and the elk. In like manner, the Caspian basin suggests *steppes* and cattle, the China plains the tea plant, the Ganges basin the bamboo and its uses. Pictures show the Himalayas, a scene on the *tundras*, the Ganges at Benares; the elephant at work, the elk and the beaver; a tea farm and an Indian village. There are three maps, a full-page relief map of Asia, without names; a small map with a few names and a relief of the Eastern hemisphere. Next follows an admirable section on the peoples of the world; the descriptions are spirited, picturesque and sometimes narrative. Special emphasis is laid on child-life. There are the usual reproductions of photographs depicting scenes of daily life, types, dwellings, etc. Then there is a short section on heat, wind and rain; some simple scientific explanations are given and illustrated by diagrams; the reasons are explained; the trade winds and the gulf stream described. The next subject is plants of the hot, warm, cool and cold belts, of course profusely illustrated. Then come animals, with those distribution-maps, so dear to American schools, in which small pictures of the animals are substituted for the names. The limits of topical treatment now narrow; a section is devoted to the United States. But, within this narrower limit, the treatment is still topical—surface; people; July 4th, 1776; corn, cotton, wheat; coal and iron; routes of trade; chief cities, etc. The only piece of sheer memorising is a list of the States, surely excusable. The sixteen chief countries of the world are then very briefly treated, with reference to climate, products, commerce, principal towns, etc. A list of statistics for reference, a number of model relief maps for copying,

a pronouncing word list and a supplement on the American dependencies close this admirable volume. In the succeeding volumes of this series a topical treatment is still maintained within ever-narrowing regional limits. In this way the necessary but dull details of regional geography are absorbed unconsciously along with a mass of useful and interesting knowledge and through constant practice in map sketching.

(3) Omission.

15. (3) With a text-book similar to the above, the teacher need omit nothing; for there is nothing superfluous. With a less judicious book, it is well that he should have a sufficiently perspective knowledge of his subject, to enable him to eliminate all that is unnecessary. As a general rule, however, it may be laid down that the teacher may (in elementary schools) omit all details that he cannot himself remember without reference to the text-book; all details connected with states or provinces other than that in which the school is situated; and (in high schools) all details about places of minor importance. "It is important to know something about the great trade centres of our country, such as New York, Chicago, Boston, Philadelphia, San Francisco, etc.; it is unimportant to know the exact location of Timbuktu, Haidarabad, Ujiji or Chingtu." *

(4) Topical treatment.

16. (4) A good deal has been said of topical treatment (paragraph 14) within such regional limits as the continent, the country and the divisions of the country. The topics to be treated are, generally speaking, those enumerated in paragraph 18. Such a treatment causes the child to look within and beyond the bald facts and the memorised lists of names which formerly constituted geography; while those very facts and names (previously so hardly learnt and so soon forgotten) are now acquired by induction, retained by reiteration, correlation and expression. As for the size of the region to be chosen, the plan of gradual narrowing, as indicated in paragraph 14, may be adopted, or a single region (such as a continent), sufficiently large to afford illustration of all topics, may be taken for a term's work in the higher grades.

* "American Public Schools," by J. Swett, page 276. The whole of Chapter IX is well worth reading.

Sometimes, on the other hand, a small area may be taken and studied, as illustrative of a group of geological or of commercial phenomena. Thus, in England, Snowdonia or the Thames basin would form a good unit for minute study. Such a scheme would, of course, be more applicable in a high school class; but small children, too, have a love for large-scale maps: and often take delight in studying a strictly limited area. The method is particularly valuable when the (high school) pupils can take a walk, or make a tour through the region chosen and afterwards map it (see paragraph 19). Sometimes regional treatment is totally discarded in favour of topical; but this can be recommended only for normal schools, or for the final classes of advanced high schools after an exhaustive regional course has been completed.

(5) Visual instruction.

17. (5) In geography, almost more than in any branch of study, instruction must be through the concrete. The child's knowledge must be built up by a process of apperception. Hence his mind must be well stocked with images drawn from (*a*) actual observation, (*b*) visual illustration. (*a*) As regards the former, the child's range is not so narrow as might be at first supposed. The common objects which form the basis of *Heimatkunde*, and surrounding hills, streams, etc., which serve to illustrate lessons on the parts of land and water, are obvious material. Storms, winds, the procession of the seasons, the alternations of night and day, barometric observations and records of sunshine, rain, dew, etc., taken at the school by the children, are not so frequently called in as an aid to physiography. Observation of the sun, the moon and the stars should certainly be utilised as a groundwork for astronomical geography, and (since objects capable of observation should naturally precede those requiring illustration) affords a useful opportunity for introducing the plan of the universe at an early stage. The starry heavens form a theme as appropriate to *Heimatkunde* as do the chairs and desks of the school-room. Then there are experiment and second-hand observation (on maps and globes). (*b*) When the subject has passed beyond the range of direct observation, resort must be had to illustration by pictures, photographs, plans, maps, raised maps and lantern displays. The

warning already given regarding science in paragraph 10 must here be repeated; illustrations must not be mere child-play; they must have a serious bearing on the subject in hand. In India, however, there is no immediate fear of overdoing the thing. Though geography books, such as that described in paragraph 14, may be too expensive for general use, yet much may be done with the illustrations of discarded weeklies, if sensibly used. The beautiful productions of the Perry Picture Company, Malden (Mass.) are not beyond the means of even the poorest village school. The German exhibit had a fine collection of geographical appliances suitable for institutions of a higher order. These were wall-sheets explanatory of maps, with the isometric drawing of a house, or the picture of a "geographical landscape" above, and the same mapped out below. Others illustrated the different parts of land and water. Herr J. Dinges' raised maps of large and small areas were a beautiful feature of this exhibit. A model of the northern firmament was capable of illumination from behind as a means to teaching celestial geography in the school-room.*

(6) Correlation.

18. (6) Doctor W. T. Harris has said of the study of the earth: "About one-fourth of the material relates strictly to the geography; about one-half to the inhabitants, their manners, customs, institutions, industries, productions; and the remaining fourth to mineralogy, meteorology, botany, zoology and astronomy."† Geography is capable, beyond other subjects, of correlation. Indeed without correlation it is meaningless. It must be connected externally and *as a whole* with science on the one hand and with history on the other. The surface of the earth has been shaped in accordance with the scientific laws of mechanics, heat, etc.; its configuration has in turn decided the destinies of man from the age of the cave dwellers to the inauguration of the Panama Canal scheme. This aspect of the subject is

* See Bibliography. These Bibliographies contain information regarding—
(1) Books used in writing these sections.
(2) Books recommended for further reference.
(3) Books recommended as texts.
(4) Appliances and equipment.

† Report of the Committee of Fifteen, 1895.

excellently set forward in the "Syllabuses of Instruction in Geography" published by the Royal Geographical Society. Second, though in the main regionally presented, it should comprise, correlated and contained within itself, something of astronomy, geology, physiography, zoology, botany, anthropology, architecture and commercial geography. It is, in fact, a veritable pudding-stone—the most comprehensive and conglomerate of the sciences. The great art in its presentation is the deft weaving of these parts into the whole, so that geography shall form a self-standing subject which, like a central Federal Government, treats with natural science and history, but forbids its own component parts to enter into direct relations with these foreign powers. In high school classes, the component parts are naturally treated more in separation. In this connexion a splendid exhibit of original work in commercial geography from the Morse School, Kansas City (Mo.) was remarkable. The treatment here is primarily topical (by products), not regional. A collection of lumber specimens, etc., afforded a good activity to the pupils. Practical reality was also given to the study by field-lessons (amply illustrated in the exhibit by photographs), in which the pupils were taken to see cattle-markets, brick-laying, fruit-markets, agricultural implements, the formation of a stream, etc. The pictures illustrative of comparison of amounts of products from different countries were very clever, and would indelibly impress the facts on the minds of the boys who drew them. But the most striking trait of all is that here the statistical maps are not copies, but the result of collaborative research, the boys finding out the facts from various books and working them up in this visual form.

(7) Expression.

19. (7) The semi-topical treatment of geography especially lends itself to expression by the pupils. They may be told to work up a subject and give the result to the class verbally. They fill note-books, as in science, with essays on the distribution of cotton, the conformation of mountains, or the routes of commerce. These, and all their work, are profusely illustrated with maps. The exhibit contained thousands of such maps, from two feet square to two inches square, and of every stage of elaboration. There were physical

relief maps; there were railroad maps, and statistical maps showing the distribution of races, climate, products and industries. The British exhibit contained one exquisite set of four little maps of India (Crawford Street Higher Grade School, Camberwell), showing (1) physical features, towns and railroads, (2) political features and chief towns, (3) products, and (4) all combined. But the American exhibits were the richest in this respect. There was a beautiful exhibit of map work from the Humboldt School, Kansas City (Mo.). Perhaps a tendency was apparent to spend too much time in elaborate map drawing and colouring. It is a useful piece of manual training to let a pupil execute a masterpiece in maps every now and then. For ordinary use, however, a rough sketch, or a large outline drawn on the blackboard by the pupil from an open atlas, is of more immediate value. The American child seems to be always drawing maps—every point in his note-book seems to be illustrated by a small one. This is eminently useful; since the sketching of a map (whether copied or from memory) teaches more of configuration and location than any amount of looking at one can do. But this profusion naturally limits the time that can be expended on each production. And a bold, rapid sketch is a better training to hand and eye than laborious minuteness of execution. Another very common feature was original raised maps. The finest of these was in the British exhibit (Liverpool Education Committee's Section). It consisted of a raised map of Snowdonia constructed by the boys of Walton Lane Council School after a holiday tour in that district. The size was about 2′ × 3′, the scale one inch to a mile both horizontally and vertically. The material was layers of thick cardboard pasted one on the top of the other according to the contour-lines, while contours of every 100′ (from 0′ to 3,560′) were indicated by different shades of green, brown, red and vermilion. The highest contour was white; water was coloured blue. The work was very exact and beautifully executed. But such a task could be attempted only by higher classes. Of simpler raised maps on a small scale the best were in the exhibit of Wisconsin. A flat board is taken and the outlines of the continent or country are traced. Nails (more or less heavy-headed) are

knocked into the board along the lines of mountains. The raised portion is then worked on in putty. The nail-heads not only reduce the amount of putty required, but fix it firmly to the board. Generally, however, the maps were made of *papier maché* (less commonly of clay). Old newspapers are steeped in a bucket overnight; in the morning the children mash them, and proceed to stick the product along outlines marked on stout cardboard. Sketches (both original and cut from magazines) were scarcely in less evidence than were maps. A child likes to write a description of a country when he can illustrate it with cuts representing, however roughly, its people, scenery or architecture. Drawing is likewise useful in comparative pictures and in making distribution maps of crops and animals.

Third stage.

20. As to high school geography only two remarks need be made. (1) The treatment in upper high school classes may reasonably lose its regional character; specialisation may be permitted in one or other of the topics with reference either to the world at large or to some small (and if possible, well-known) area. Thus, specialisation in physiography and in commercial history may be allowed. Such a plan, permitting as it does of collaborative research, is likely to be very useful for pupils of this age. (2) It is desirable that geography (as well as other special subjects) should, in high schools, be taught in "sets," not as part of the regular class work. The work having now become specialised, it is well that a teacher who takes special interest in it should undertake it.

III. In history. First stage.

21. III.—Science and geography having been treated at length, it remains to give only a very brief account of natural methods in the third of the related trio-history. Here whatever is done in the first stage must admittedly be according to the simplest and most natural method. A few stories told either independently or in connexion with early lessons in nature study and geography will suffice to awaken the child's interest in the various branches composing this subject.

Second stage.

22. Nor must the study abruptly take on a formal guise. "The natural way of imparting historical knowledge," writes

Herr Neubauer, "is narration. In the preliminary stage, the teacher must narrate, as father or mother narrates stories to the children at home. And so it is in the middle and higher classes; the demands upon the perceptive faculty, the understanding and the judgment, increase; but narration still forms the kernel of instruction. Historical facts can be neither deductively derived like the truths of mathematics, nor inductively discovered like the rules of grammar. It is often deplored that in historical study more than elsewhere the pupil is condemned to mere reception and impression, and it is proposed to set a portion of the text-book for home preparation and subsequent discussion in the class lesson. It appears, however, that such a procedure would only serve to increase the difficulties for pupil and teacher alike. The pupil would be expected to impress upon his own mind things which he does not yet fully comprehend; the teacher would be obliged to forego the advantage of that moment of expectation which materially facilitates the assimilation of the fact narrated. And it must finally be considered that in noisy and broken discussions the impression upon the pupil is weakened, and that the matter is one requiring orderly explication; the epic frame of mind, the inspiration of historical instruction, would be frightened away from the outset. Our opinion, therefore, cannot be altered, that if the pupil is not to be wearied, only two ways are possible—first, to narrate in the liveliest and most exciting manner permissible; second, to draw on the pupils, so far as possible, to collaboration with the teacher. To take the second first, very varied opportunities for arousing the pupil's sense of independence offer themselves—in deriving the new from the known; in elucidation of the past by comparison with present circumstances; in the examination of causal relations, the estimation and comparison of personalities, situations and events, and in the ascertainment of results. *

* * * * * The syllabuses recommend freedom in treatment of the material and in lectures, since thus alone can the teacher's personality have its full effect. By this it is naturally not meant that he should not use his notes here and there. But the reading of elaborate note-books is

deprecated, and it is true that such a procedure does easily lend to the instruction an academic and abstract colouring; the teacher loses sympathy with his hearers and falls into the danger of using long words and talking above their heads. The teacher must not cut himself adrift from the text-book, but at the same time he must not let the text-book swamp his own independence. If he pays no heed to it, he thereby makes the pupil's task more difficult, and forces him into the taking of notes *verbatim*. Against such note-taking valid arguments are the considerations not only that the pupil often sets down on paper incorrect and inconsequent information out of which he cannot disentangle the essential, but that this method has a kind of stupefying effect on him, and prejudicially affects the fresh, free assimilation of the matter before him.

* * * Repetition of narrative by the pupil is the weighty proof of comprehension; as such, it must not be omitted from the *Sexta* to the *Prima* (*i.e.*, during the full nine years of secondary education), and must be replaced by mere questioning only exceptionally—whenever, that is, either a very easy or a peculiarly difficult part of the subject crops up. Such repetition is also of great value to our pupils (who, even in the higher classes, often cannot easily be brought to express themselves in methodical language) as practice in the reproduction of comparatively simple trains of thought. If questions on isolated points cannot alone succeed in attaining the goal of this instruction, then, on the other hand, repetition of the whole offers its services in checking mechanical modes of impression; and it has often proved a useful plan to have the pupil's repetition preceded or followed by a few questions relative either to the facts or to their inter-relations."* This passage will serve to show how natural methods—lively narrative, correlation of parts and expression by the pupils—are carried out in Germany; it expresses the principles which will be found practically applied in the Philadelphia elementary schools. Here we find that children of even the third grade (age eight to nine years) hear nothing but disconnected stories.

* Translated from "*Die Reform des höheren Schulwesens in Preussen*, page 234 and following.

No attempt is made to burden the mind with a long series of related events. A child likes to read of a man, of a battle, of a voyage of discovery; he abhors political relations of cause and effect. He requires picturesque details, which a broad survey cannot supply. He is a worshipper of heroes; but these must be real human heroes, with whose personal life he is intimately acquainted—not the mere skeletons which the ordinary text-book has no leisure to clothe with flesh and blood. Thus, the principal epochs of his country's history should be indelibly impressed on the child's mind by vivid pourtrayals (aided by pictures) of men and events. Not till the fifth grade (age ten to eleven years) does anything like systematic history begin; and even here the treatment, as in geography, is still semi-topical. The single points previously impressed on the memory and imagination are now used as pegs on which the warp of narrative is gradually drawn, while a running commentary on manners and customs, on the history of civilisation, forms the woof and completes the fabric. Details which belong to important personalities and events are given in profusion; otherwise they are omitted; and thus a sense of historical perspective is early aroused. Thus, very few dates are to be learnt; but those must be deeply impressed. Memorising is not to be abolished; for in history it is essential. But that which is to be memorised must be thrown into tabular synopses, easily grasped and appealing to eye and ear alike. The connexion of geography and history is made real; and historical map-drawing, as a mode of expression, forms a separate item in the course. The study of constitutional polity, than which no subject is more abhorrent or more incomprehensible to the young, is treated of only in the highest grade and then as a distinct branch. Not till then is the pupil sufficiently grounded in historical ideas to derive any benefit from even the simplest study of the details in methods of Government. In one respect, however, exceptional treatment is permitted. The history of the town or State in which the school is situated is handled with much greater detail; and, in the St. Louis public schools, very simple instruction regarding local municipal government is orally given as early as the third grade but in the geography, not in the history, course.

Third stage.

23. In the high school the range of history naturally widens, and laboratory methods, dependent on the reading of good library books, come to take the place of oral instruction along the lines of a text-book. By this time, too, the pupil has acquired a skill in drawing which will permit him to express his ideas and illustrate his written work by something more than sketch maps and magazine cuttings. Light and interest are thrown on an era or a nation by a study of its art; and considerable pains are taken in American schools to acquaint the pupils of the higher classes with the characteristics of architecture and ornament. This is done practically in the drawing lessons. The exhibits contained many pourtrayals of the Greek orders, and something of Egyptian, Assyrian and mediæval design.

Summary.

24. The subject of natural methods has been treated at great length because the weightiest lessons of the Educational Exhibit appeared (to me at least) to lie in this direction, and because these methods are sometimes of such a nature as to require a cloud of witnesses to demonstrate that they have passed into the region of widespread, established, practical facts, and are not the lucubrations or isolated experiments of a few faddists. If they have attained their extreme development in America, yet the more conservative countries of the old world are independently working them out along the same (if slightly soberer) lines. All may not be good; all certainly is not universally applauded. "Our happy children," writes Professor Münsterberg, "the public thinks, see and touch everything, when we had only words on words. But the words appealed to a higher power than the demonstrations; those spoke to the understanding, these to the perception; those gave us the laws, these the accidental realisations." It is hard to accept this view in the light of the evidence expressed by this representative exhibit in favour of natural and objective methods—of the use, in elementary stages, of the whole of a child's faculties for the assimilation of knowledge, for its hinging on to the observed or the previously known, for its vivid expression; of the calling into activity, in the higher stages, of the mental powers (now sufficiently strengthened), for arrangement of the facts acquired, by laboratory methods and research in supplementary reading.

Application to India, with reference to—

25. In India, the tendency is to thought and speech, not to observation and action; to the subjective, not to the objective. This makes all the more necessary the application of the concrete, observational, expressive element as a corrective, and at the same time the use of care and deliberation in its gradual introduction. We can afford to watch the effect on the rising generation in America of these new principles, while appropriating for our own use that which is obviously best. The salient features in this section, which appear to stand out and call for application, are the following.

(1) Science.

26. (1) A comparison of certain exhibits presents two ideals of elementary science teaching—the American and the English—the former of which appears applicable to primary and middle schools in India. The one is discursive, informal, dealing largely with zoology and botany; it is, in fact, a slightly crystallised species (probably the only possible species) of nature study. Hence, introduced into our rural schools, or added to the already existing agricultural lessons,* it would widen the child's mental horizon, awaken his powers of observation, and give him fresh interests in life. Anything approaching to instruction, however simple, in physics, chemistry or any branch of formal science is out of the question in our rural schools; and in middle schools, other than those situated in larger towns, from which the pupils may be expected to proceed to high schools, it is probably undesirable. When, however, a boy is likely to carry on his studies in science through higher grades, an early beginning is generally recommended; and this may reasonably be made along experimental and semi-informal lines.

(2) Geography.

27. (2) No portions of this section are so important as those dealing with geography. For the semi-topical treatment (as I have called it) of this subject, that is, the introduction of topics within ever-narrowing regional circles, appears, once and for all, to offer a solution to the grave difficulties of this branch of study. By this method the interesting and useful information, which gives life and meaning to bald facts, is thrust into the foreground and consciously

*Which are, in reality, lessons in nature study, or at least serve the same purpose. See "Rural Schools in the Central Provinces," pages 82—83.

grasped by the child; the bald facts which used to constitute purely regional geography, necessary though they are, now take a second place, and are assimilated by a process of unconscious induction aided by reiteration and expression. It may be objected that Indian schools cannot afford the text-books, the equipment and the quality of teachers, necessary for adopting such a method. Then let geography be taught without text-books, save for one good, expensive text-book for the master, from which he can first educate himself and then impart his ideas informally to his pupils. The mere possession by the master of a good illustrated atlas on the lines of H. Harne's *Volkschulatlas** would go far to remove the ever-recurring difficulty of teaching the British possessions and general geography in our schools. As for equipment, the inability of a school to purchase it is of immense advantage; for that means it must be made on the spot. A master can learn much from making his own plans and maps, and from practice on the black-board. If it is complained that boys cannot afford paints for map-drawing, let them make ink sketch maps, pencil relief maps, or free-arm copies on the board. Above all, let master and pupils set to work to make raised maps (as described in paragraph 19). This is far easier than manufacturing globes (which is already done in our schools to some extent; and I may add, by way of encouragement, that very few amateur globes were shown in the exhibit, and those far inferior to what I have seen turned out in India); while the master makes an elaborate raised map for the school, the boys can make their own on a smaller scale and will enjoy the occupation, for, as one of the exhibitors remarked to me, "they naturally like to make spit-balls and such things." Illustrations need present no difficulties; if illustrated weeklies cannot be procured, yet beautiful pictures for use in geography, nature study, history and art can be obtained for sums ranging from a half-penny to twopence half-penny a piece.†

28. (3) In India, history lessons for the young are often characterised by academic formalism and show a total lack of sympathy with the youthful mind. To rush through the full length of Indian (3) History.

* See Bibliography.

† The Perry Picture Company, Malden, Massachusetts, U. S. A.

history in a few meagre chapters is useless; a series of bright, concentrated pictures will have a far greater effect. The child loves narrative; but it must be narrative illuminated by detail, not by logic; which appeals to the imagination, not to the reasoning faculty. Studies of polity must be brought within reasonable limits; they are intensely dull to the young, and can have but little meaning unless preceded by some knowledge of the trains of facts leading to the results described.

(4) Syllabuses.

29. (4) A very valuable general lesson of the exhibits was the advantage alike to inspector, examiner, teacher and pupils which may be reaped from the official publication of highly detailed plans of work. In America, the Superintendent's office frequently publishes a plan of study in every subject, generally given separately in a series of little pamphlets. (I may instance New York State and the cities of Philadelphia and St. Louis as examples which came under my notice.) Such instructions are not intended necessarily to supersede text-books, certainly not to fetter the master as to originality of treatment. But they give him confidence by showing precisely what is expected of the class, and act as a guide in his treatment of the text, preventing too servile an adherence to it and emphasing from a different point of view those portions of the subject which demand special attention.

(5) Drawing.

30. (5) A vital condition of success in the methods above described is the power on the part of the pupils to delineate by map drawing and sketching. It is hardly possible to convey an idea of the amount of good work done by this means that was displayed in the British and, still more, in the States' exhibits. Almost every lesson is in part a drawing lesson, and helps not only to train the hand and the eye, but also to give life and interest to the subject immediately in hand. So important is this matter that it must form the subject of a separate section.

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## Section II.—DRAWING AS A MODE OF EXPRESSION.

**Faults of previous ways of teaching drawing.**

31. The title of this section may seem absurd. What is drawing save a mode of expression? Drawing, as taught in the majority of schools twenty years ago, and in some to-day, promoted not expression but repression—repression, that is, of all the latent powers

of imitation and artistic feeling which every normal child to some extent possesses. Before his education in drawing had commenced, the child loved drawing and could draw (incorrectly, it is true, but still expressively). After six months of having his fingers squeezed into an unnatural position, six months of making straight lines, two years of copying cones, prisms, etc., first from pictures, then from models, another two years of the same sort of work on uninteresting vases, then a similar period of monotonous shading, his taste and his power were both crushed beyond hope of recovery. The unsympathetic method obliterated, as effectively as if designed for that purpose, the very faculty that it was supposed to develop. It was mistaken as regards both (1) subject-matter, (2) method, and (3) organization.

(1) Subject-matter.

32. (1) If the child is to gain interest in his work, the tasks set him must be such as he will like to accomplish. But he was put down to draw lines, curves, standard forms and objects, till he came to look upon the delineation of a man, a horse, a tree or a house as something foreign to the true principles of plastic art—something to be attempted only out of school hours and by stealth. Whereas it is psychologically established that a child from six to nine years of age possesses the artistic tastes of primitive man—anthropomorphic, epic, abhorring the still beauty of form, hankering after the delineation of life and of events. From the ninth to the twelfth years his bias changes; he begins to see interest in the more elaborate forms which come beneath his notice—houses, trains, trees, etc. From twelve to fifteen a further change takes place, and he likes to draw simpler forms and learns to appreciate the chaste beauty of outline. The old system, instead of letting the child commence with voluntaries and imaginative pictures of men in action, etc., begins at the end, and so is always instructing the pupil in just those subjects which his age unfits him from enjoying.

2) Method.

33. (2) The method of teaching, too, was illogical. It placed an object before the child and laboriously instructed him in the technique of copying it. It recked not of the idea and the mental image. And yet children do not copy objects, but images. Place a junior class which has had little or no drawing instruction in a circle round

a frying-pan, and tell them to sketch it. Even those towards whom, or away from whom, the handle is pointing, will draw the pan with the handle sticking out to right or left, because that is the idea of the object in their minds, which is so strong as to overcome the impression of the model before them. Of course their drawings are incorrect; the mental image must be rectified by a study of the model; and finally, the mode of delineation must be shown by placing a drawn copy before the child or, better still, executing one in his presence. Often, in practice, the last process must come first, as in the early delineation of action, where copying forms the first stage, imaginative drawing the second and drawing from the life model the last. But, whatever the order adopted in time, the logical order is first the formation of images, second the correction of images, third the training in technique requisite for the expression of images. Drawing masters of the old school attend to nothing but the last. To take another example, it is quite right that children should make an early study of "type forms" (sphere, cube, cylinder, triangular prism); but these must not be laboured over as though they were ends in themselves. The pupils must learn to sketch them in rapidly and roughly, as an eye-training, not as a hand-training, and as a means to acquiring a ready grasp of proportion and unity of form in whatever they see before them.* In a word, model drawing, memory and imaginative drawing and the study of forms, must be practised from the very beginning, not postponed to a late stage.

(3) Organization.

34. (3) It was customary to remove the child from his own class-room to a special drawing-room, whose unfamiliar aspect awed him, where a strange and unsympathetic master unconsciously demonstrated to the class that they were unable to draw, that they very probably would never be able to draw, and that therefore he himself took no personal interest in their efforts. The tasks set before them were not only distasteful, but utterly unrelated to the work they were pursuing in their own room; and, since the drawing classes were held only twice a week or so, they lasted about an hour at a time—a period far too long for concentrated attention in a

* Augsburg's Drawing, Book I, page 88.

junior pupil. What was the result? That in a week, or may be a month, the pupil, after much dozing, whispering, erasure, weariness and tears, managed to produce an unsightly and repellant representation of a circle or a triangle. Had he received instruction for ten minutes at a time once or twice a day, as a break in the ordinary lesson, in his accustomed class-room, from his own teacher (who at least knows the pupil's name and something of his capability), in rapid, impressional sketches of things correlated with his lesson or his activities, he would have made infinitely more progress in the same period, and this very sense of progress would have stirred him to fresh efforts.

Some opinions.

35. It may be thought that these remarks are now mere platitudes. This is not so. No subject of instruction has made such rapid strides within the past ten years as has drawing. The wonderful collection of specimens of drawing, water-colour sketching, etc., by children of tender years, which formed so striking a feature of the Educational Exhibit, must have been a revelation to many. But, even here, it was obvious that stereotyped methods were not everywhere dead. The following quotations will show that official insistence upon drawing as a mode of expression is still required. In Prussia, the ordinance of November, 1900, expressly commands attention to rapid sketching of objects seen. "The intention of this order is, that the pupil should make such progress as to be able really to draw, that is to say, he should not, if after several years of instruction he be asked to depict clearly and faithfully this or that object with simple media, despondently announce his inability. For the attainment of this proposed end, the new plan of studies requires drawing from real objects and from nature to be practised from the beginning of the subject in the *Quinta* through all classes. It further demands that the pupils' feeling for colour as well as for form be developed, and that not through theoretical training, but through actual practice in the direct delineation of the colours of nature. Further practice in sketching and drawing from memory is prescribed in all classes. By such practice the pupil must learn from the outset to grasp the essentials of the appearance of any object at a rapid glance and to impress them on his mind as a

lasting possession. His drawing must prove that he has acquired a clear idea of the characteristics of an object, such as an egg, a ring, a leaf, a butterfly, a vase, a fruit, etc. * * * * The artistic tendency of the plan of studies, displayed as it is in all these commands, finds its highest expression in requiring that opportunity be also afforded the pupils of giving spontaneous and practical proof of their natural ability to delineate. While formerly it was frequently found that those pupils who were really most talented took no pleasure or pains in the drawing taught at school, now, on the other hand, it is the task of instruction not only to push on the average pupil as much as possible, but also to discover talent and to secure freedom for its individual development."* Similarly the University of the State of New York lays down rules of guidance for high schools:—"Drawing is primarily a means of expression. Satisfactory results cannot be expected if the practice in drawing is confined to the drawing class. Like writing, it should be applied generally in the school work wherever an opportunity is offered, and abundant material may be found in almost every subject. Scenes described in the reading lessons may be illustrated, cuts found in the geography and geology may be reproduced, plant forms may be drawn, the figures referred to in mathematics may be constructed, etc. Practice in drawing out of school hours should also be encouraged. A home sketch-book will afford recreation, while at the same time it will lead the pupil to observe closely and record graphically what he sees. While the quality of line and finish of the picture depends on skill in execution, it must not be assumed that drawing is wholly a matter of hand training. Quality of line and finish is to drawing what penmanship is to composition. More important are thought, conception, knowledge and a desire to express, whether it be in line, light and shade, or colour. The ability to express by drawings depends in a large measure on the development of imagination, the power of carrying in mind a correct and vivid picture of the thing to be represented. The study of the object is of course essential, but the

* Translated from *Die Reform des höheren Schulwesens in Preussen*, page 309.

student should also learn to draw without it. This is specially true in industrial drawings, where the object represented is made from the drawing, not the drawing from the object. In this work the order of development is the mental picture—the drawing—the object."*

Comparison of British and American styles.

36. Instructions such as these found ample illustration in the Educational Exhibit. The British section displayed (at least in the higher grades) the most perfect work. The Americans have gone further in freedom of treatment, in complexity of simultaneous branches, and in the reduction of technique to an inferior position. The result is that in American schools the children of the lower grades show a marvellous versatility and rapidity in form and colour appreciation; in high schools and colleges, the excessive number of branches and the comparative inattention given to technique begin to tell, though in boldness and originality of design American students can hold their own against any. (A very beautiful exhibit was that of the New York School of Applied Design for Women, consisting of designs for houses, interiors, wall-papers, book-covers, carpets, rugs, chintz, silk, etc. Most of these designs found purchasers among upholstering firms.) The British exhibit, on the other hand, while not so strong in the lower grades (save in the work of pupils of obviously exceptional talent), was characterised in the work of the upper grades by vividness, exactitude of observation and technique, good taste and a general impression of restrained and self-reliant power.

American methods and their application in India:—

37. I have preferred here to treat chiefly, though not exclusively, of American methods, not only because these were naturally more fully illustrated, but because they represent the most extreme development of the new system of drawing instruction; and hence a consideration of them is more likely to accentuate the points of contrast with the methods I have usually seen pursued in India. Moreover, our students do not usually continue this subject through high schools and art colleges; and there is no doubt that the American system leaves the junior pupil with the maximum power of expression which can be acquired in a short

*Academic Syllabus, 1900, page 172.

course. To treat the method adopted with anything like fulness lies far beyond the scope of these pages. Those who may wish to pursue the subject further are strongly advised to study "Augsburg's Drawing."* The publication consists of three volumes; but Book I contains most that is required, especially if supplemented by the excellent set of "Graded Practice Books" by the same author. But five salient points appear to call for special notice.

(1) Amateur teaching and professional supervision.

38. (1) It has already been suggested that drawing properly forms a part of the ordinary class lesson. This plan, opposed to that of "sets," does not appear either to trammel the talented or to leave the slow behind; there are, of course, great variations in excellence of work; but a good average is maintained. Nor, though the whole of a class is taught together, does this necessarily mean that the pupils never receive any instruction other than that which an ordinary class master can impart.† Special hours for drawing under a special drawing master can, of course, be arranged for side by side with the introduction of an element of drawing into all class subjects. Still, every class master must be able to instruct his pupils to some extent in delineation; and the application of the methods described in this and the preceding sections to, say, urban schools in India, would mean the devolution of this kind of instruction upon some high and middle school masters and many vernacular teachers, who would be quick to disclaim any knowledge of the art. It is easy to imagine the universal cry that would go up: "We cannot draw, still less teach to draw." The great beauty of the American system is that it permits of teaching by amateurs. Not a few of the educationalists connected with the exhibits assured me that neither they themselves nor the responsible teachers could draw that which the pupils easily accomplished under their supervision. I was informed in the office of the Supervisor of Drawing for the City of St. Louis that most

* See Bibliography.

† But in certain cities, *e.g.*, St. Louis, the class master or mistress is invariably the drawing instructor in the elementary (public) schools, and often so in the high schools.

of the teachers who had to look after drawing are amateurs. And a note on page 77 of "Augsburg's Drawing," Book I, obviously shows that the case is contemplated in which the master is unable, without mechanical aids, to do that which the pupils will be expected to accomplish by the eye alone. How, then, is teaching possible? In the first place, the very method pursued, being a natural method, not dependent upon elaborate training in technique, will, in its practice, confer no small power of execution on teacher as well as upon pupil. Second, the larger cities maintain a Supervisor of Drawing in the office of the Board of Education, who, aided by expert Assistants, not only receives and comments on the work of pupils in the public schools, but also goes round, instructs the teachers, and shows them where their methods fall below the mark. Third, syllabuses of drawing are compiled by the Supervisor and distributed by the Superintendent, which show very precisely what is required. It is to be regretted that the course of study in drawing for the St. Louis public schools is too long to print as an appendix. Fourth, printed reproductions of ink and pencil sketches by good pupils are distributed to give teachers an idea of the subjects, treatment and technique which should be aimed at. Finally, books of the nature of "Augsburg's Drawing" are available, which will enable any amateur by a little practice and patience to make himself a tolerable draughtsman and a more than tolerable teacher. None of these is impossible in India. The regular drawing master of the local high or English middle school could, and already to a large extent does, supervise the drawing work in the ancillary institutions.

(2) Variety of branches.

39. (2) Four branches of drawing (nature study, foliage, objects and the human figure) are commenced even in the lowest class in Boston (Mass.) schools, as well as silhouetting and paper cutting and pasting. Not only the subject, but the medium, is constantly varied. The pencil is used for outlining, for massing, for light and shade. Chalk is used, as productive of those positive effects which appeal to children more quickly than do suggestions. Coloured chalks supply a good medium for voluntary work, etc. Drawing by the whole class upon the black-board is largely

practised, especially ambidextrous drawing. Brush work with ordinary or drawing ink, both massed and outlined, is common in English as well as in American schools. In St. Louis, ink massing is insisted on largely in the very first year—wisely, for this type of work accustoms the child to study and delineate the form alone and to leave out all detail, to which he is naturally prone to devote too much attention. In the same city work in water colour begins at the commencement of the first (*i.e.*, lowest) grade, when the child is only seven or eight years old. I have the colour work of an entire third class—the subject being "Roosters;" the method was that of "dropping" described in Augsburg's Drawing, Book III, pages 66-67. Such subjects, involving the use of bright local colour, are very useful in the lower grades; and one of the commonest subjects in American schools is groups of Chinese lanterns. Butterflies, too, are useful models and interest the children. Landscape work in wet washes, however, is begun early (I have a book of fourth grade work in landscape); and eighth grade landscapes are often quite works of art. Of course geometrical drawing is taught; and isometric drawing and orthographic projection are sometimes added; but these branches generally begin later. It is needless to point out the interest which this variety exercises upon the child, and the power of expansion which it gives him. It might be thought that, when so much is done, nothing can be well done. Not only the exhibits but also unexhibited school work points to the contrary.* It might be objected in India that so varied a course necessitates too expensive an equipment. Several camel's-hair brushes, a supply of drawing (or even of common) ink, and a paint-box † of eight tablets (the six prime colours, warm grey and cold grey) are all that are needed above what already exists in every school. And such a paint-box may

* By the kindness of Mrs. Riley, Supervisor of Drawing, St. Louis Public Schools, I was supplied with a mass of school drawings, some of which I have retained. Among these are books containing the work of a whole class on one subject—the worst as well as the best. These specimens sufficiently prove that the work shown at the exhibit was not, as was sometimes hinted, above the average.

† See Bibliography.

be obtained for one shilling. The colours would be particularly useful, not only for the purposes indicated above, but also for making designs. Original design was quite a feature of the exhibits. In British schools, the process, so far as was apparent from specimens, consisted in the drawing of a natural flower and leaves (or similar object) by the pupil. This is studied, analysed, reduced to conventional form, thence into a single, and again into a reduplicated, pattern. Exquisite designs are made by American high school pupils. An incentive is the competition for acceptance of designs for the back of school exercise books (which are beautifully ornamented), for the title page of the school magazine, for leather stamping, etc. Of course this creates a tendency towards a "bill-poster" style; but it can be guarded against; and the designs for mosaics, stained glass and tiles are often admirable in taste.

(3) Models.

40. (3) It has been pointed out (paragraph 33) that, while the natural order in respect of models is: (1) memory and imagination, (2) objects and figures, (3) drawings and pictures, yet this cannot always be practically followed out. Nevertheless, the child is often started on purely imaginary subjects. A lesson is read; a story or a poem is recited to him; and the child is then called on to illustrate the event or the thought. Or he is told to draw a particular subject; I have a set of drawings, made by a first grade class, illustrating a boy pulling a sleigh. This work of course requires correction by observation of models and by practical illustrations of the technique of expression. The extent to which such correction is carried varies locally. Sometimes the teacher will draw the picture on the board, or show a sketch on paper, and tell the pupils to treat the subject in a similar (but not servile) manner, either with the copy still before them, or from memory. In the St. Louis schools, however, even this practice is discouraged, and only models are used. These models are made as natural as possible. Real vases (not plaster imitations) are placed before the children; real leaves, flowers, fruits, etc., to be copied sometimes in pencil, sometimes in ink, sometimes in water colour. Tree studies are made largely from actual trees growing outside; studies of

architecture from views, afforded from the school-room windows, of houses, churches, etc. Landscapes are either imaginative (a fundamental transgression of earlier theories) or made during excursions. Similarly, figure studies are from life. The German exhibit had a splendid collection of stuffed birds and beasts as models. But this would not suffice for St. Louis, where live rabbits are introduced (at the risk of indiscipline) into the class room, and a lady supervisor may even be seen dragging a recalcitrant goat up to the third floor. Another method is to take the children out to the zoological gardens with their pencils and drawing pads and let them draw the animals as they see them lying, standing, or moving about. I saw the efforts of a whole class of very small children in this direction; they were beginners and had been working under difficulties in the park; hence the results were crude; but the boldness shown in the general delineation of form and in the foreshortening of bodies and limbs was remarkable and worth any amount of correct lines and careful workmanship. Finally, when the human figure is to be delineated in repose or in action, a pupil is called upon to serve as model, seated, standing, holding a chair, brushing the floor, pulling a rope, etc.

41. (4) All this may seem to go too far. What is the use, it is objected, of giving the child difficult models or mere imaginative suggestions, and telling him to draw them, when he knows nothing about drawing? The answer is three-fold. If the method here described is wrong, yet it is not so wrong as trying to teach the child to know about drawing without ever letting him draw anything save abstract forms—a system in which all progress is precluded because all interest and reality are deadened. Second, the strict logical order of image, correction and expression, while adhered to as far as possible, cannot always be practically applied. Augsburg's books are particularly instructive on this point. He gives many rules of technique and recommends copying from the flat as the first stage in some branches. But the difference between these and the old-fashioned rules of technique are, that, while the latter dealt with the so-called elements, the former rush into the more advanced stages of the subject, thus giving the pupil an early

(4) Inductive acquirement of technique.

confidence and sense of power, and leaving the elements to look after themselves. Thus, we are comforted to hear that "there is no particular position or prescribed rule for holding the pencil. No particular way is natural for all. Forget the pencil, forget the hand, in the intensity of interest in the idea; and in the majority of cases there will be no need of correcting the hand." There is no preliminary drill, no "alphabet of straight lines." Nevertheless, we are confronted at the outset with rules on technique. What kind of technique? The technique of depicting action, which was previously regarded as one of the *arcana* of the drawing master's art, to be imparted only after years of toilsome initiation! "Dear to every child's heart is life, the vital element of action, and the vital element of a drawing. If this element is lacking, the drawing is uninteresting, however carefully it may be drawn. Action expresses life. * * * Of the three elements of drawing, *form*, *colour* and *action*, children love *action* best. Form is of very little interest to them unless coupled with *use* that lends interest to the form, but action that expresses life is always interesting." Unfortunately, "children must learn *how* to represent action before much progress can be made in expressing it. The child can hardly do this by direct observation. * * * * The best way is, first, to learn the action through the copy, and gain power by practice in expressing the action; then use it in imagination and memory work, and lastly, use direct observation to verify, correct and perfect the representation of action already gained." Hence the master instructs the pupils in technique by drawing on the board numerous repetitions of the human form (represented by an oval for the head, an elliptical mass or a single line for the body, and lines for the limbs) in every kind of action—walking, running, jumping, catching ball, striking, tobogganing, bowling a hoop, flying a kite, firing a gun, etc. He shows the proportionate lengths of the different limbs, indicates their position in each action, and gives a few "straight tips," such as that children are indicated by proportionate enlargement of the head. The pupils copy all these drawings over and over again, and then proceed to copy similar drawings (now in outline) of the antelope

standing, grazing, listening, turning round, frightened, running, bounding; and so on, with different animals. Many other technicalities are taught—skill in drawing curves, not abstract curves, but curves forming part of a simple design; the massing of foliage, not in a few branches hung in air, but in a tree; the value of line accent; the method of proportioning the limbs of the body or the features of the face by horizontal lines. Perspective, too, both visual and scientific, is shown by simple rules before the pupil has begun to regard it as one of the unattainables. In a word, the rules given (always deduced from copies drawn) are practical and helpful, not petty and irritating. And this leads us on to the third answer, which is that the results previously aimed at (but seldom attained) in the insistence on a mass of preliminary, detailed technique, are now attained inductively and without trouble through practice. The pupil, being interested in his work, takes pains to make a straight line, a beautiful curve, a regular shadow mass, when these things are required, simply because he is keen about the general effect of the work he is engaged on. Throw him boldly into the middle of things, and he will anticipate much that was previously drilled into pupils with infinite drudgery. The whole key-note of the system is the formation of correct images. The grasp of a form as a whole and the right subordination and location of its parts are regarded as more important than correct drawing. Once the mental habit has been formed, technical skill will come of itself; in drawing, the pupil learns to draw aright; and his power of observation, thus developed, will render him capable of drawing anything. *Res crescit eundo.*

(5) Picture study.

42. (5) In the higher grades, American teachers employ yet another method for cultivating taste and developing technical skill. This is picture study. A copy of a good work of art—say a landscape—is placed before the class, or better still a smaller copy in the hands of each pupil. The points of the picture—composition, perspective, management of distance, effects of light and shade—are analysed and studied. Not only does this teach the learners to appreciate a good picture, but it discloses to them the best methods of obtaining effects. A good plan of impressing the latter

point is to take the pupils to see a landscape something resembling that in the work studied, and setting them to sketch it in the light of the lesson they have just learned. An obvious objection in India would be the expense of such large numbers of copied pictures. Yet these can be obtained in America at from one to five cents apiece (see bibliography of Section II, Perry Picture Company); and, in towns, a stock could be kept in the central school, and sent round to the smaller schools as wanted, to be returned when studied.

**Correlative value of the system.**

43. It is not needful to dwell on the value of such a system of drawing as a form of manual training. A few words may be added on the helpful part it can be made to play when correlated with other subjects. It is connected with kindergarten occupations, which should be looked on as part and parcel of the same instruction in the art of expression. Paper folding, cutting and pasting, silhouetting, the making of coloured pictures by applying forms of coloured paper—these are the common stems from which drawing and manual training both arise. It is connected with reading; because the child loves to draw that about which he reads; and the drawing impresses the words upon his mind. It is connected with mathematics—in the infant class by enabling the child to illustrate his simple problems; in the higher stages by enabling the pupil to draw correct figures. The close observation entailed in drawing a flower or an animal not only aids and enlivens nature study—it is in itself a form of nature study. The sketching of science apparatus, the making of maps, the tracing of geological sections, the delineation of mountain formations, the picturing of national flags, emblems, dress, dwellings, types of countenance, and of local flora and fauna, products and industries—all these demand the power of rapid and expressive drawing. History may be illuminated by it; to make a sketch of a Romanesque church seen from the school-room window will teach the pupil more of that style and its spirit than the perusal of a hundred photographs; and historic ornament is a common and very pleasing subject for design in the higher grades of American schools. Finally, it is a substantial aid in manual training, where working drawings—elevations, cabinet and isometric drawing, and orthographic projection—are a necessity.

Its application in India.

44. There is no reason, on the score of expense, why this system should not be applied in Indian schools. The only objection (and that a truly great one) is likely to be found in the timidity of masters totally unaccustomed to teach drawing or accustomed only to antiquated methods. The application of the system, even in a modified form, would have to be slow at the first, commencing in the normal schools and gradually radiating outwards. Once fairly started, it would probably thrive, as it has thriven in America; for there is something infectious about it, something that breeds a healthy emulation. As to the wisdom of attempting it, I do not hold the system up as perfect; it has already been remarked that, for those at least who intend to carry the study to an advanced stage, the inductive method of acquiring a knowledge of technique is probably a drawback. But such pupils are comparatively few; the ruck leave school or abandon drawing after a few years of struggling with meaningless details, unable to draw even a simple object. *For the majority* this system appears to be the best yet invented. It gives to the child a new power, which may remain a source of pleasure and profit to him, brightening school and home alike, through boyhood and on into riper years. To the artist, the artisan and the mechanic it would be invaluable, giving him the power of easy and accurate delineation, of conceiving new designs, of grasping novel forms.

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Milton Bradley Company, Springfield, Massachusetts. ("A-1" paint-box of eight colours, with brush, 25 cents, new pans of colour, 3 cents each. "Little Artist" paint-box of seven colours, 15 cents, but not so highly recommended. Painting blocks:—No. 1, 6″ × 9″, 50 sheets, 10 cents; No. 2, 9″ × 12″, 25 sheets, 10 cents.)

## Section III.—THE REFORM IN MODERN LANGUAGE TEACHING.

Introductory.

45. It might seem presumptuous, after the copious treatment which this subject has received in various publications, such as Volume 3 of Special Reports on Educational Subjects (Board of Education, Whitehall), to do more than merely refer to these works. Two supplementary tasks may, however, be usefully attempted—first, a detailed description of some one system may be given, instead of merely hinting at the methods, say, of Gouin or of Berlitz, of which the reader often possesses but a faint idea. Second, such modification and application of the system may be suggested as is required to suit a special case. Thus, I propose to give some

account of the reformed method of teaching modern languages in Germany (with some sidelights from France) and to apply the same to the teaching of English in India. This presupposes that English is to be taught as a modern language—a point which some might deny. The obvious answer is, that English is a modern language; that to teach it solely as a classical language is to forego the facilities of instruction which a modern language offers through conversation, and to shut one's eyes to the necessity of treating it from a colloquial standpoint; that, since many boys will get only a smattering, the instruction should be made as broad and practical as possible; and, finally, that the modern method, as well as teaching a pupil to talk, renders him as capable of reading the best authors, of understanding the grammar and of absorbing the spirit of a language as did the old, and that in an incredibly shorter space of time.

Vietor.

46. The central aim of the reform is to treat modern languages as Herbart would treat Greek when he says that its study should begin with the Odyssey. The former method (and it is not yet altogether obsolete) encumbered the pupil's path with grammatical rules, with masses of exceptions, with memorising of declensions and conjugations, so that, at best, the conclusion of his education gave him but a 'Pisgah-sight,' if indeed his wanderings in the wilderness had not filled him with an abhorrence, only equalled by his ignorance, of the promised land. Modern methods would clear away these barriers from his path and set him at one step in the midst of his destination, so that, no longer sickened by the difficulties of the approach, he may be allured by every sound and sight to explore the new demesne. The movement commenced in the middle of the last century, when Plötz made known his "cut and dry" method (of which it might truly be said that it was "dried by the teacher and cut by the pupil"), and Ollendorf composed his laughter-compelling conversations. In 1882 Wilhelm Vietor (under the *nom de plume* of *Quousque tandem*?) hurled his pamphlet, *Der Sprachunterricht muss umkehren*, like a bombshell into the educational world. "He contends for the view that the centre of gravity of instruction be transferred to a continuous course of

readings—a thing which Plötz had never dreamed of as theoretically possible; he contends against the view that authors should be treated only as running illustrations of grammar and its rules. He casts aside home-exercises as 'breeding-grounds for the vermin of mistakes,' and, overleaping the mark, gives vent to his battle-cry (too often cast back into his teeth), 'Death to rules and laws.' As a specialist in phonetics he requires rational teaching in sounds, sketches a course of instruction in which the text-book will often be closed and the pupil called on to narrate its contents in the foreign tongue, and finally takes up the bold position that 'translation into the foreign language is an art which does not lie within the province of the school.' * * * * He reminds us that we should have consideration for the state of the child's mind—a point which had been much neglected. Interest and pleasure had been extinguished; they must be re-awakened and restored. Excessive demands made upon the reflective understanding are inappropriate to the genius of childhood; excessive straining of the memory through dry forms is hurtful to it. The implication of analogies, the instinctive familiarisation with the language, the forgotten power of unconscious appropriation, which are all comprised under the term *Sprachgefühl*—all these faculties must be restored to their proper place. Imagination, too, and feeling, all the child's ethical and æsthetic potentialities, require nurture. The old cry of Rousseau: 'Not words, words, words, but things, things, things!' is also the leading motive of the will in learning a language. Concrete instruction must accompany verbal instruction." *

Münch. 47. The many issues raised by Vietor's writings were gathered up, modified and at the same time widened by Münch. While condemning present practice, he is still not ready to abandon written translation "though he sets great store by free composition. But French exercises should not, like Latin, consist of wearisome collections of phrases and expressions translated from German, but of imitations of French writers progressively arranged, carefully

* Translated from *Der Reform des höheren Schulwesens in Preussen*, page 197.

prepared for the lower classes and not soaring to such themes as 'French genius,' 'Moral picture of Goethe,' 'What is the Divine Comedy?' Münch agrees with the reformers in this too, that purely mental study does not give mastery of a language. He, like them, demands better phonetic instruction, though he does not approve the elaborate preparations required by the 'Phonetic School;' he wishes to see grammar limited, Plötz and his mechanical methods banished, who, whatever appreciation be due to his services and historic position in the movement, 'can never lead to any sure knowledge and capability,' who makes the pupil the slave of his text-book and thereby drags him down to a lower level." He commends the inductive system of grammar, while at the same time deprecating the exclusion of necessary deduction and systematic study. The value of text-books is to lie in their contents, not in their illustrations of grammar, and that not only in the higher classes (where national character and history will be studied), but in the lower too, where nothing but good material must be laid before the pupil.

**Combination of their views in present practice in Germany.**

48. Taking Vietor and Münch as types of the reformer and the moderate reformer, let us consider how far the views of each find place in the present system in Germany. In the schools more and more attention is directed to pronunciation, fluency and expressive emphasis, not only in the lower, but in all classes. The teaching of a phonetic script, though not forbidden, has generally been abandoned. But the teaching of phonetics has spread even into the universities and shows the best results. Practice in conversation is now a feature of all grades. The conversations are suggested partly by the readings, partly by common objects or occurrences, and by maps, pictures, etc., with which the school-room is for this purpose supplied. "Very rightly is the warning added: 'These conversations must not crystallise into a lifeless interchange of question and answer.'" The value of vocabularies is recognised. Sometimes the pupils make vocabularies suggested by a text-book; sometimes new words are impressed upon the mind only through the medium of object-lessons. The reading lesson now forms the chief factor in instruction, and "at least in the second half of the

entire period of education must offer subjects of real worth treated in good form." The moderation of this behest shows that the more perfect plan (of adopting sound subject-matter from the beginning) has not yet become universal, and that its acceptance lies with the teacher. "A new concession as regards the method of free translation is the recommendation that, in place of the translation into correct German, an occasional discussion of the text in the foreign tongue is permissible. This recommendation will bear good fruit, especially when modified by the wise limitation, which permits of such a discussion only so far as the trustworthiness of the teacher and the development of the pupils ensure, in the course of the procedure, the full disclosure of the ideas contained in the passage." The teaching of grammar is no longer inductive—a second concession to the old method. Translation into the foreign tongue, though it still finds a place, is subordinated to original composition. Such is, in brief, the latest published code of instruction (1901); it allows full scope to the new method, while leaving much to the judgment of the individual, the only point of reform on which it insists is the importance of conversation. As to the burning question whether any use is to be made by the teacher of the mother-tongue, the official pronouncement is that for difficult explanations and grammatical instruction the mother-tongue may be utilised; but that the use of the foreign language, so far as possible, is desirable, specially for lessons on literature, history, etc. Turning to examinations, we find that in higher boys' schools the pupils must understand the chief authors of the last three centuries (in English, since Shakespeare). In the final examinations of the *Gymnasium*, translation from French into German has been abandoned and superseded by an oral test of the pupil's power of understanding and speaking the foreign tongue. In that of the *Realanstalt*, a compromise has been made to suit supporters of both systems, by giving choice between an essay or a translation, sometimes in one, sometimes in both, of the languages offered. Throughout, writing is held of less importance than speaking; no written test in modern languages is prescribed for the *Gymnasium*; in the *Realgymnasium* it is required in only one; in the *Oberrealschule*

written tests for both languages have been retained, on account of the longer time at disposal for devotion to such subjects in those institutions. The exhibition contained a good deal of written examination work in modern languages; spelling and grammar were generally correct; idiom remarkably good.

49. The chief characteristics of the reform may now be examined with reference to their bearing on education in India.

Characteristics of the reform as applicable to India. (1) Phonetics.

50. (1) Phonetics are neglected in our schools. The complete adoption of Vietor's method (see Appendix II) has not been deemed desirable in Germany. It would be still less desirable in India, where boys hitherto ignorant of the Roman character would be suddenly confronted with two scripts—the phonetic and the orthographic—both in a new alphabet. The confusion thus raised in their minds might become ineradicable. Minor difficulties are the burden entailed on the memory by the phonetic script, the wrong idea of the value of letters which it is apt to convey and the postponement of orthography. Various methods have been suggested to minimise these difficulties:—The framing of Readers with phonetic transcription half way through and phonetic vocabularies throughout; the use of phonetic charts only, without transcription of text; phonetic reproduction of the text in an appendix, or purely oral instruction in the beginning. None of these devices would serve in our schools; and yet the need of a sound phonetic basis of instruction is very great in India, where the natural scripts are mainly phonetic, so that the learning of English (in which spelling is excessively arbitrary) presents a peculiar difficulty. Perhaps a practical solution of the difficulty might be found in the following scheme:—

(*a*) A fortnight of purely oral work at the commencement of learning English. This would be devoted to simple instruction in phonetics (as outlined in Appendix I), especially as applied to any easy English words which are known to the boys or which come readily to hand. Constant practice on the part of the pupils would be required in hearing and in articulation; and the whole should certainly be illustrated by a set of

diagrams showing the positions of the tongue and the lips in framing English vowels and consonants, on the model of Rausch's *Laut-Tafeln*.*

*b*) Constant reference back to the principles instilled during this preliminary fortnight should be made throughout the whole course of instruction. For this purpose the use of a phonetic chart appears to be indispensable; but the chart should depend, both as regards its form and its nomenclature, upon an appeal to the eye, not upon tabular classification or arbitrary symbols. (i) The best form for adoption is the vowel-triangle (Appendix II) of Vietor, which can also be applied, though not quite so suitably, to consonants. It consists of an inverted triangle, of which the base is a line connecting the centres of the hard and the smooth palates, while the apex is the position of the back of the tongue in articulating *d*. Hence the very form of the chart roughly indicates the position of the tongue during each sound, and gives a visual series from guttural to front palatal and (in the case of consonants) to dental, labio-dental and bi-labial sounds. (ii) As regards nomenclature, it is probably needless to suggest that the terms used should not be such as have just been employed, but simple, unscientific names, such as "throat-sounds," "lip-teeth sounds" (see the terminology used in Vietor's "German Pronunciation"). An almost more important question is that of symbols on the chart. To use the names above suggested might be possible; but their length would sometimes be awkward. Since phonetic script is to make no part of our scheme, the use of its symbols and diacritical marks (as employed by Vietor) cannot be thought of. To use oriental letters as symbols would be misleading, because they

* See Bibliography.

would convey to the minds of the pupils sounds slightly different from those intended. A feasible plan appears to be to make the chart in the form of a large wall-sheet, and to locate the positions of the tongue by means of small pictures of sections of the mouth, as is done in Rausch's *Laut-Tafeln*. But the system could easily be extended to all vowel sounds and to consonants, and would be helpful as a piece of visual instruction. In the reading of a passage by master or by class, a boy would be called forward, and made to indicate with a pointer on the chart the position of vowels or consonants. This demonstration would not only locate them in the ascending scale from gutturals to front-palatals, etc., but would likewise show to the boys the position of the tongue-back or blade, the proper aperture between the lips and the proper amount of fulness or pouting to be given to the lips.

Such a system, methodically carried out, should serve to cure the faults of pronunciation so apparent in our middle and even our high schools. Indian vernaculars are rich in consonants, which thus present little difficulty (save when the position of the English *t* and *d*—midway between the palatal and dental letters of Prakritic languages—has to be indicated). With vowels the case is different; not only have the strongly closed, almost cerebral, *o* and *ou* sounds to be abolished, but the modified *a* and broadened *e* sounds (unknown to the Indian) have to be introduced. This could be effected quickly and once for all by the simple method indicated above. It is needless to say that some such elementary knowledge of phonetics produces purity of pronunciation in the mother-tongue as well—a quality often most sadly lacking in Indian pupils.

(2) Text-books.

51. (2) Our text-books must be reformed. (*a*) First Readers must no longer consist of strings of disconnected sentences, nor the more advanced of stories which often insult the pupil's mind by their triviality. In the very first page we must plunge *in medias res*, taking as our basis any single words or phrases of the

foreign language with which the children are likely to be acquainted. Thus, Hausknecht's "English Student" commences with a string of words—"England, John Bull, Lord, Lady, gentleman, roast beef, plum-pudding," etc. It would not be difficult to imitate this in India. Then follow some single sentences: —"Do you speak English?" etc.; a comparison of written and printed script; some proverbs, and then the little poem, "Work while you work." Next come names of places with their location, such as "Liverpool on the Mersey," which afford useful bits of conversation and references to the map; and then the months and numerals. After that we are in full swing with a dialogue on getting up in the morning between two Charterhouse boys; the dialogue is thrown into narrative form; the narrative is reduced to questions and answers. This gives occasion for the first grammar lesson, which, be it noted, is not on the foreign names and definitions of parts of speech, nor even on the gender and number of substantives, but on the colloquial forms of the verbs "to be," "to have" and "to do," *e.g.*, "I'm," "you hadn't," "he doesn't." From the outset, the subject-matter is bright and interesting. (*b*) But more than that, it must be solid and valuable. The first few pages may smack somewhat of the cap and bells, or aid, and at once interest the pupil by presenting in a new tongue fables and legends that he has known in childhood. But an early transition to biography and bits of history (always relative to the country whose language is being studied) is recommended, as well as to geography and simple science lessons, which give opportunity for discussion and for the use of *Realien* (the objective surroundings so much valued by the Germans in teaching a new tongue). The progress of the Indian student may be hampered by the strange script; but this cannot be for long; his intellect at the age of ten to fourteen years is bright; his imitative faculty is enormous. And yet he is still struggling at foolish and distasteful stories in his fourth year of study, while the German, in his second or third, is reading matter which would be considered with us difficult for an Entrance class. The want of speed is probably attributable not to the horse, but to the rider. If we removed the curb and gave him his head, our animal might

do miles while he now plods furlongs. (*c*) Further, the text-book must suggest methods to the master, while at the same time leaving him to work them out. When a full set of questions and answers is printed out at the end of a narrative, the master feels that he can dispense with preparation before, and with exertion during, the recitation; the discussion becomes formal and lifeless, and the whole point of this kind of instruction is missed. The reader should give ample opportunity for the resourcefulness of the master. Nothing about the lesson should be inevitable; for it is the inevitable that, more than the difficult, crushes and disgusts the youthful mind. When the child awaits the unexpected, his faculties are on the alert. The book must therefore offer, and the teacher must seize, opportunities for surprising the pupils. Even a really extempore conversation must not consist of mere question and answer, but, like a discussion, should be liable to vicissitudes of treatment. Nor must the lesson always lead up to a conversation; sometimes a bit of geography or grammar must be suggested, sometimes a reference back to a previous lesson, sometimes ten minutes of phonetics, sometimes a narrative explanation on the part of one or more pupils. In these matters, however, a book, be it ever so excellent, is valueless in the hands of a mentally ossified instructor.

52. (3) The conventional method of teaching grammar must be abandoned. It has been shown above that the most recent regulations on the subject in Germany prescribe a deductive system in modern languages. This view, however, does not commend itself to the profession, and is regarded as retrogressive. At the same time it is admitted that not all grammar can be inductively taught; but the deductive treatment must be postponed. A compromise appears possible. The important point is that the reading lesson should no longer be regarded as a mere vehicle for teaching grammar. Second, formal (deductive) grammar lessons should be few, and not introduced too early. Third, the way to these formal lessons must be paved by a long series of inductions spreading through the whole course. By induction is meant the discovery of new grammatical forms in the lesson, and their correlation with the forms previously found. But the following example will, better

(3) Grammar.

than any definition, illustrate what is meant, besides giving an excellent model of a year's course after the new method:—

*Instruction in English in the Obersekunda* of a Gymnasium.*

The writer† begins with a fable from the first part of the Reader, such as "The Wolf and the Lamb." The child needs no new subject-matter, since he is interested in the language itself, and is pleased to see a story he knew as a child given in a new language. Sounds and their combinations, words and short phrases, are pronounced, and repeated by the pupils. A short time is spent on articulation of most sounds, but a longer on articulation of difficult sounds like *th*.

A sentence is now read, first in bits, then as a whole, by the pupils. Then follows the translation. The occurrence of a question suggests a declension, and its repetition is set as an exercise for the next day's lesson. This leads on to forms of the present of "to have" and "to be" which occur in the lesson. Then the imperfect, the participle and some of the compounded tenses of these verbs are taught; only the future is still kept back; not all grammatical forms can be obtained inductively.

When the fable has been told from beginning to end, and learnt by heart, then follow the first conversations on what has been read; and, as a first school exercise, the pupils must write down the fable out of their heads, decline nouns occurring in it, and write down some forms of "to have" and "to be."

A second fable is similarly treated, and the conjugation of the remaining tenses of "to have" and "to be" is given.

Then comes a little story (similarly treated) suggesting present and imperfect of regular verbs; and a conversation on the subject-matter.

A little poetry, such pieces as "My heart's in the Highlands," is now attempted. [I was interested to find in the exhibit of the

* From the form of the lessons, it appears that the pupils are beginning English. This is quite likely in the *Obersekunda* of a *Gymnasium*; though it is possible they might have done a little in the previous year.

† *Lehrproben und Lehrgänge*, Volume XIX, page 71. I have compressed the subject in translation.

Elberfeld *Realgymnasium* a number of class-exercises done by the boys on this subject. The poem was first written down from memory, with wonderful correctness, though the occurrence of spelling mistakes showed the authenticity of the documents; then suggested sentences, as "The mountains of the Highlands are covered with snow," "We love our home," "Do you admire the mountains of the north?" then paradigms (with present, historic and perfect tenses only) of various verbs suggested by a verb in the passage]. Conversation on the subject-matter follows, with completion of the forms of regular verbs. (In this lesson particular attention is paid to articulation).

Now commence the regular conversation-lessons on objects readily to hand. The first is on "The School."

Meantime vocabularies of words and phrases are attended to, and impressed on the pupils by revision and practice in writing and speaking.

An extract from the Reader is next taken—"Geographical description of Great Britain." Such a concrete lesson gives the best opportunities for elaborate conversations, the scholars describing in English what they see on the map.

An opportunity is now taken to show tenses compounded with "to do" as an auxiliary, and thus to close the system of conjugation.

A piece of the (geography) lesson is now given as dictation or retranslation, or questions on the subject-matter are dictated in English, to be answered in English.

Now the irregular verbs are learnt with reference back to the regular.

Another regular conversation-lesson is given, the subject being "lessons."

Historical characters, such as "Alfred the Great," are now introduced, and the lessons treated in the same way. At this stage the important irregular plurals and feminine forms are shown.

Now comes an extract from Scott, followed by the chief pronouns.

The numerals (already largely learnt inductively in the course of lessons) are now correlated.

Dictation of the last lesson (with some variations) follows as a class-exercise.

As home-work, retranslation and a few original exercises are given.

The year's work ends with general revision and correlation of grammar already learnt; and with conversation-lessons on "furniture" and "meals."

In the next year the boys begin with pieces which would be considered worthy of our "Entrance students."

The French Exhibit contained a very interesting scheme for extending this inductive system. This is no less than the composition by the child of its own grammar.* The book is a mere skeleton, whose sections are to be filled by the pupil with the aid of examples which he has assimilated in the course of class exercises. "For it is not sufficient," explains the prospectus, "for the purpose of giving a fruitful instruction in grammar, to pass from example to precept; it is necessary that the example, or rather that repeated examples, should have already created in the mind a tendency conformable to the letter of the law, which, without in any sense teaching anything which the pupil did not already know, should sanction an order of things previously recognised as necessary." The road to a knowledge of formal grammar is to be prepared in ordinary lessons, where idiomatic instinct can be gained, without any theoretical explanation. Then, when the master deems the moment has come to call the attention of his pupils to certain grammatical facts, he chooses, from the material well known to the whole class, examples fitted for illustrating these facts, and makes them enter them under the headings which govern each. "As each set of examples is filled up, the corresponding rule disengages itself before the pupil's eyes and becomes evident; this rule, only now formulated and written at the foot of the list which has made it apparent, is the living synthesis of the examples."

* *La grammaire composée par l'Élève*, by H. Landenbach; Edouard Cornely, 101, Rue de Vaugirard, Paris.

53. (4) We must widen the inlets of knowledge by utilising the eye. This idea is in thorough accord with the German love of *Realien*. Pictures and objects adorn the class-room. Their uses are various. They impress on the child's mind the historic scenes or personalities which they represent. They awaken his artistic propensities. And, with regard to the teaching of language, they have three great uses:—(*a*) they serve to define and to impress upon the pupil the connotation of a new word, and so save reference to the mother-tongue. "The underlying thought is this—by visual illustration the comprehension is brought into direct contact with the word without any roundabout reference to the mother-tongue. But, apart from this, experience shows that pictures strongly support the power of observation and contribute to the enlivenment of the lesson; and so one may conclude that foreign words grasped in the course of a lively visual demonstration are more firmly impressed and retained."* The method may at first sight seem childish; but its adoption would probably show its value, since it is founded on good psychological reasons. It is not, of course, necessary to go so far as Klinghardt, who "forbade, so far as possible, all translation in English lessons in the *Realgymnasium* and thoroughly excluded the use of the mother-tongue, while he explained everything in the foreign language by referring to well-known objects together with the help of illustrations, various gestures and mimic movements." (*b*) Pictures readily suggest a wealth of conversational subjects. The same is the case with maps and any other objects of this sort. In this connexion I would refer to a very interesting lecture given before the National Educational Association by Mr. Worden, Instructor in German, Central High School, St. Louis. Mr. Worden practically demonstrated his method of teaching German from pictures. Thus he displayed an engraving of a hunter having his boots pulled off by a servant, and rehearsed conversations held with the pupils upon its details. The next picture (*Der erste Brief*) gave occasion for a different treatment. The master reads a description of the picture first slowly, then fast; the pupils, with the picture still before them,

(4) Objective treatment.

* Translated from *Die Reform des höheren Schulwesens in Preussen*, page 214.

write out a description as far as possible from memory. A coloured print of the promenade at Ischl suggests some remarks by the teacher, including Longfellow's impressions of the place; the pupils thereupon write imaginary letters from Ischl, utilising the data they have heard from the teacher. Finally, Mr. Worden demonstrated a more difficult kind of lesson, suitable only for advanced and apt students. A picture (of a bride putting on her shoes) is shown to them; and, without any comment, they are called upon to make up and write down a little narrative on the subject. Some of the results were passed round and proved excellent. Again, to pass from the theme of pictures to that of common objects and their uses, "the actions of the pupils and their teacher are also utilised for conversational purposes. (In a lesson on French) the master's '*Ouvres les livres,*' is followed in chorus by '*Nous ouvrons les livres.*' Sentences are connected with the actual occurrences they represent, as, '*Prends la craie!*', '*Compte les vitres!*' All the pupils' activities are drawn into the circle of speech:—Excursion for a bathe and return, work in garden and field, and so on. The pupils describe the school-room, the school, the way to school, their lesson hours, the school festival, the town, the buildings, the environs, the fatherland and foreign countries, thus launching into ever wider and wider spheres of observation. For the explanation of new words, all objects which are easily accessible are displayed, and actions are used as illustrations. Although many teachers go too far in this matter, yet no fault can be found with the method so long as it remains within those limits which the dignity proper to a school imposes. Many teachers have now attained to wonderful proficiency in the explanation of words and in the power of training their pupils to speak and to understand; and in many schools, even in *Realschulen* of six * classes, the pupils can speak with hardly a mistake worth the name throughout the whole lesson."† (*c*) Thirdly, it is maintained that a plentiful use of pictures, maps, photographs, etc., of the country whose language is being taught, materially assists in

* The *Realschule* has only six classes, the three higher standards being found in the *Oberrealschule*. Hence it is inferior to the usual nine-standard high school.

† Translated from *Die Reform des höheren Schulwesens in Preussen*, page 215.

placing the pupil at a standpoint where his sympathies with the genius of the nation in question will be aroused, and his grasp upon idiomatic thought and expression strengthened. Thus, in a German school, the walls of a room where English is taught are decorated with maps of Great Britain and typical scenes from London and from the country. Very striking was the display, made in the exhibition, of such aids to the study of Greek and Latin; restored buildings, plans, costumes, historical events, etc., were pictorially represented, with a view to surrounding the pupil, as far as possible, with the atmosphere of those ancient civilisations. Much may certainly be done in India in this direction. Schools in which English is taught are not generally so poor as to be unable to purchase good coloured sheets of English scenes. Or, if these cannot be obtained, pictures from the illustrated papers are always available, and, if properly treated, may serve both as topics and as explanations. The occasional display of the lantern can be made of great value. But, in all such work, the warning must be added, that the picture must be treated, not as a mere artistic and interesting plaything, but as an illustration of the subject in hand—as a means rather than as an end.

(5). The medium of instruction.

54. (5) We must in every way encourage the growth of *Sprachgefühl*. This phrase has been translated as "linguistic feeling," an expression which may be enlarged into "an instinctive tendency towards correct idiom." This can be attained only by constant practice, until thought and speech alike naturally frame themselves in the foreign tongue. To this end, it is very necessary that English (in our secondary schools) become the medium of instruction in lessons on that language. This important precept of the reformed system is in no sense irreconcilable with the policy laid down in the Resolution of the Government of India, nos. 199—211 of the 11th March 1904, in which it is stated that "when the teaching of English has begun, it should not be prematurely employed as the medium of instruction in other subjects." Instruction in history, geography, mathematics, etc., can continue to be given in the vernacular up to the age of thirteen. Nay, supporters of the new method themselves advocate the use of the mother-tongue, even in

foreign language lessons, for the explanation of difficult matters and special instruction in grammar. But, onwards from the age of ten (at which a bright boy will enter a secondary school), every word of the English language lesson must, with the reservations just noted, be in English. This is the more important, since at that age mind and mouth can most readily adapt themselves to the idiom and the pronunciation of a foreign tongue; by every year that is lost, the task becomes incalculably more difficult. Due progress in the vernacular (a matter on which too much stress cannot be laid) will be secured by the parallel study of vernacular texts, and by the conduct of the great bulk of lessons in the mother-tongue, to the study of which, indeed, more time may be devoted, in proportion as we adopt methods whereby the attainment of English will be accelerated. It is true, the master may be in the first instance puzzled by the necessity of conversing with boys in a language to which they are complete strangers. But a characteristic of the new system is the large initial progress made with a small vocabulary; and the use of gestures (to a very limited extent and only at first) and of objects will largely relieve the difficulty. It would, perhaps, be impossible to teach the English script without some explanation in another language; for the Indian youth, unlike the European, is not necessarily acquainted with the Roman character. But such instruction would not be alien to the spirit of the reformed system, provided it abandoned the alphabet in favour of practice in phonetics. Indeed, the postponement of written instruction, until oral teaching has given the pupil some command over his tongue and his ear, seems a matter worthy of favourable consideration. Once the initial difficulties are surmounted, there is but little reason why the use of the foreign language should be less suitable for an Indian learning English, than for a German learning French.

**The Berlitz system.**

55. This last topic can hardly be left without some mention of the Berlitz method, some information regarding which is given in Appendix IV. This method is an imitation of the natural process whereby a child learns its mother-tongue. Its main feature is the sole use of the new language in the course of lessons. The reasons assigned for its excellence are as follows :—Translation,

which generally forms so large a part of instruction, necessitates waste of time over long explanations in the learner's own tongue. The ordinary methods cultivate neither thought nor use of idiom in the foreign language. Equivalents for words or expressions in one language often do not exist in another language. The methods by which the place of explanation in the mother-tongue is supplied are three-fold. (1) The concrete is taught by object-lessons. The teacher's desk is stocked with objects which he uses and shows. Pupils are kept attentive by orders to do things. When objects do not suffice, the teacher does not hesitate to use the black-board, as when he sketches a clock-face to indicate that a pupil came in ten minutes late. There is no doubt that the initial difficulties of grammar created by translation from or into the mother-tongue are avoided by this visual instruction. (2) The abstract is taught by association of ideas, and the use of new expressions in connexion with words already known. (3) Grammar is taught solely by examples. The working exhibit in the St. Louis Exposition was proof enough of the wonderful efficacy of the system. The classes consisted of pupils from the local high schools who had no previous knowledge of French. But M. Marduel, the instructor, while allowing that the method could be successfully applied to children of twelve or even less, as well as to adults, at the same time was not sanguine as to its results with any but very small classes (say, up to eight) which permit of individual attention.

**Memorising, vocabularies and retranslation.**

56. Lest the changes suggested above appear too drastic, it is necessary to add that the best exponents of the new method are not in favour of the total abolition of all the modes of instruction now in use. (*a*) Learning by heart, both of poetry and of prose, is so far from being regarded as old-fashioned, that it is insisted on more than ever. But it is the actual language, not rules regarding it, that is to be memorised. Almost every lesson, at least in the early stages, is committed to memory. The task becomes easy with practice, and forms one of the best methods of impressing upon the pupil the elements of pronunciation, idiom, and grammar, as well as supplying him with a valuable vocabulary. A favourite way of conducting an "inductive" grammar lesson, is to take an expression

from the passage before the pupils, and then call upon one of them to repeat a past lesson in which the teacher knows that a similar example occurs; the two examples are correlated, and an induction, with the aid of other examples, is drawn to a general rule. (*b*) Vocabularies of words and phrases are recommended. These are kept by the children in note books. Perhaps the simplest and most efficacious plan is to arrange the words as they occur in the lessons; in this way the mere reading over of the vocabulary recalls the purport of the stories; and the association between word and word, between words and the sentences and passages in which they occur, forms a valuable piece of memory training. (*c*) Notwithstanding their condemnation by Vietor, written translations from the mother-tongue into the foreign language have by no means been abandoned. Exercise books and examination papers in the German Exhibit were full of them, though translations into the mother-tongue seem to have almost wholly disappeared. An original essay is an alternative to retranslation in the leaving tests of German high schools.

**Conditions of successful application.**

57. Such are the general principles of the reformed system which appear applicable to our English-teaching schools in India. Certain conditions are, of course, necessary, before any such application can be made successful. Details, such as the arrangement of benches, etc., in the class-room, must receive attention, so as to enable any pupil to come up rapidly to the black-board. A supply of lively and at the same time solid text-books (as described in paragraph 51) is a necessity; as also is the abolition of formal grammars and re-translation books (at least in all the earlier classes). Far more important are the demands which the new system makes upon the teacher's character. Versatility, enthusiasm and resourcefulness are requisites in the delivery of lessons which, if prepared, must at least bear the appearance of spontaneity, but which are better thought out beforehand only in outline, their actual conduct being guided by the suggestion of the moment, the humour of the pupils, and the instinctive appreciation thereof by the master himself. As for the pupils themselves, their attitude towards the lesson will depend upon the leadership of the master. If he can cause

them to enter into the spirit of the thing, they will become interested and their wits extraordinarily sharpened. The constant speaking of the foreign tongue, at first in chorus, then individually, will quickly breed confidence. In some schools of France, it is customary for each pupil in turn to take his seat in a raised chair before the class (while the master retires to the back of the room) and to harangue it in the language which is being studied on some subject which he has had opportunity to prepare by reference to the school library. This harangue is the commencement of a discussion.* (It may be added that in America lantern lectures are sometimes delivered by pupils, as likewise speeches in the mother-tongue on unprepared themes.) Without proceeding to such cold-blooded extremes, it will probably be found that a tactful application of the reformed system will enormously increase the quickness, the powers of concentration, the memory, the faculties of hearing and of speech and the general self-reliance of the pupils.

Probable success.

58. The success of the system among European children could be measured by the great number of exercises, original essays, answers to examination papers, etc., in the English and French language, which were contained in the German Exhibit. They displayed correctness of grammar and idiom, power and fluency of expression. Without referring to the Berlitz system, which is excellent, but whose success probably depends upon the smallness of classes as a condition, yet I may illustrate the possibility of conducting a lesson in a large class, without any language save English, to students not only quite ignorant of English but actually unacquainted with any tongue common to all. This is what is actually done in American evening classes, etc., for immigrants. The New York Exhibit contained a photograph of such a class, comprising students of from twelve to sixty years of age, and of no less than twenty-seven different nationalities. But can such a system be applied to oriental pupils? Certainly, because of the precocity of their imitative power. If this is doubted, the fact remains that in the native schools of Singapore an application of the Berlitz system,

* *Société des Professeurs de Langues vivantes; Bulletin mensuel*, No. 2, June 1903, page 51.

modified by the use of a text-book (none other than Hausknecht's "English Student" referred to in paragraph 51) was found highly successful.* It is but natural that conscious power of expression, and the interest of discovering worthy subject-matter through a new medium, should produce a healthy sense of progress which will in turn result in a rapid accumulation of vocabulary, idiom and inductively discovered grammar rules.

References. 59. Finally, I must refer to a valuable little work, "New Methods of Teaching Modern Languages,"† by Doctor Leopold Bahlsen, on the model of which I have constructed Appendices I and III. The latter suggests a most practical method of conducting elementary lessons in a foreign language. I must also acknowledge my indebtedness to the author, for the light thrown upon the whole subject by frequent conversations with him in the Educational Exhibit. Other examples which may be advantageously studied are to be found in Volume 3 of the Board of Education Special Reports, pages 477 and 483.

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## Section IV.—SOME TYPES OF COMMERCIAL SCHOOLS.

Value of commercial education.

60. It is impossible to approach the subject of commercial education without certain misgivings. The opinions of those who have made a study of it are not altogether cheering. In his valuable and amusing article on commercial education in the United States,* Mr. P. J. Hartog has given various arguments for and against it. One cannot but feel that such education, unless very wisely guided, may tend to substitute precocious dexterity for breadth of view, cleverness for honesty, the worship of the dollar for wholesome culture. On the other hand, the common schools are adopting a practical standpoint which may serve to meet the exigencies of modern industrial conditions, and the universities (of America at least) are doffing their "cloister spirit" in favour of a training fitted for "purposes of masterful reaction with an external world." Whatever may have been said of "College Hoodlumism" and "the total absence of the college graduate in every department of affairs," the general impression made by a study of the Reports of the Mosely Commission is totally opposed to such sentiments; one of the most striking traits of the American people is their implicit faith in general education, elementary, secondary and higher. Mr. T. Barclay, who claims to have enjoyed exceptional opportunities

* Board of Education, Whitehall; Special Reports on Educational Subjects, Volume II.

of ascertaining the opinions of Americans generally on educational questions, asserts that the "idea of specialising for business purposes at school is not current among business men."* And what of subsequent specialisation? "It had been assumed," says the same authority,† "that commerce is a profession like the law or medicine—as if there were a body of principles applicable to commerce and a mass of experimental knowledge based on them which can be classed and taught in the same way as different branches of legal and medical science. When the subject was approached in detail, we‡ found that there were no principles but those of the science of economics, which is not the same thing, and that what was really useful to men in business was a more or less specialised adjunct of secondary education." If such opinions are to be accepted, then the special training of those intended as captains of commerce is a mistake, and the only valuable development of commercial education is the purely technical preparation of *employés*; the leadership must be left to the man of natural sagacity or to the scientific amateur whose general culture has enabled him to master anything to which he turns his mind, who "learns his science as he wants it and when he wants it." Nevertheless, it is a significant fact that the great commercial and industrial awakening of Germany and America has been more or less synchronous with the establishment of the great commercial *Hochschulen* (which might be aptly termed colleges) in the former, and the rise of numerous business colleges in the latter country. These institutions are, in truth, more probably an effect than a cause of the activity in trade, which has created a large demand for clerks and managers. Still, they constitute an interesting branch of educational phenomena. And, as ampler provision than now exists "for school training definitely adapted to commercial life"§ is demanded in India, it may be useful briefly to examine some types.

* Reports of the Mosely Commission, page 396.

† *Ibid.* page 394.

‡ "A number of leading educationalists and public-spirited business men of Liverpool."

§ Supplement to the *Gazette of India*, March 12, 1904, paragraph 35.

1. Higher commercial education. (a) In the commercial schools of Germany.

61. In dealing with higher or university commercial education, one cannot omit some mention of the great German *Hochschulen*. That at Leipzig is closely connected with the university; this arrangement has secured an interchange of thought and study which, combined with the resultant saving of expenses and the financial support of the State and the Municipality, has resulted in such success as, at the time of its founding, was totally unlooked for. The school at Aachen is not supported by the State but by the Aachen Chamber of Commerce. It is not a separate institution, but forms part of the technical *Hochschule*—a plan which gives facilities for wide special studies by the commercial students and for commercial instruction to the technical students. The course is of two years. The success of this enterprise has not fully come up to expectations; but statistics are misleading, since many, who are not formally enrolled in the course, take advantage of the lectures given. The school at Cologne is unconnected with any other institution. Founded by private endeavour, supported by the Municipality and the Chamber of Commerce, it supports eight permanent teachers and utilises the services of professors of the Bonn University (with which, however, its connexion is not so intimate as is that of the school of Leipzig with the Leipzig University) and of business men who volunteer their aid. The regular course is much frequented; still more so are the commercial lectures on wider subjects. The Academy of Social and Commercial Science at Frankfort, supported by the town and founded only in 1901, aims at a very high and wide course of instruction. The measure of its success is still awaited. In addition to these four well-known examples, courses of commerce have been opened in various technical schools and universities. The institutions particularly mentioned are academical in character. The pupils are under no particular discipline. The courses are special; and the instruction is planned for those merchants who will take leading parts in trade and commerce, and who have, for the most part, already undergone a nine years' course in a secondary school.*

* *Königliche Technische Hochschule zu Aachen. Denkschrift*, 1902.

(b) In the University of Birmingham.

62. So much for general organization. As for curricula of study, a good example is that prescribed for the degree of commerce in the University of Birmingham, which has as its object "the education, not of the rank and file, but of the officers of the industrial and commercial world."* It comprises the following subjects:—

(1) Languages and history. (i) The undergraduate has probably not much knowledge of modern history. Its study will give him an impression of great national movements, such as the French Revolution and the American Civil War, will "mitigate his insularity," show him the political motives which modify economic motives on the part of different races, and will secure him a more sympathetic personal relationship with foreigners. (ii) Two languages must be learnt. The study in each shall comprise, first, some classical reading for general culture and purposes of correspondence and travel; second, a mass of "current industrial, commercial, financial and statistical literature of other countries."

(2) Accounting, that is, a knowledge of the proper use and interpretation of accounts. This comprises (i) book-keeping; (ii) explanation of forms of accounts suitable for various purposes, and analysis of accounts for computing earnings and values; (iii) departmental and cost accounts.

(3) Applied science and business technique. Here some freedom of choice is allowed. All will take commercial law; those looking forward to mercantile pursuits will study the technique of trade, money and banking and transport. Those who propose for themselves a manufacturing career will study applied science. The intention is not to make the students experts, but to give them more interest in their

* "The Faculty of Commerce in the University of Birmingham; its Purpose and Programme," by Professor W. J. Ashley.

businesses and in new processes, and to cause them to know when to call in an expert.

(4) Commerce. (i) A description of the present position of industry and trade in the chief countries of the world —geography, natural resources, supply of capital and labour, the state of the mechanical arts. This is to be learnt, not by rote, like German Waarenkunde, or through commercial geography, but by a connected survey of the dominant features of the situation. (ii) Higher business policy touching the difficult problems which constantly confront a business man— capitalisation, advantages and disadvantages of limited companies, markets, advertising, good-will, etc. The difficulty in this branch of the subject is to obtain material for study.

II. Secondary and higher mixed courses.

63. The next type of institution is less ambitious. It may be called mixed in two ways—first, because the instruction it imparts is something higher than would be called for in a purely secondary school while not on a par with that given in the institutions just described; second, because its education is liberal as well as special. It should be useful in producing assistant managers, secretaries and clerks. Such institutions exist in America; there is a good two years' course on these lines at the Drexel Institute. A good European example is the school at Reichenberg in Bohemia.* The students received into this school vary considerably in qualifications—some have completed their secondary course; others have had only four (out of a full nine) years' secondary schooling; others have gone as far as the preparation class of commercial *Hochschulen*. The equipment of the school, as seen by the author, was quite primitive; the classes were held on the top floor of an ordinary school, with microscopes to test wares, and small collections of natural history objects, minerals, earth colours, metals and textiles. Similar good schools were found in small towns of 5,000 inhabitants. The curricula of certain Polish schools appear worth notice.†

* Described by Mr. J. Baker in "Report on Technical and Commercial Education in East Prussia, etc.," Board of Education, Whitehall.

† *Ibidem*, page 37 *et seq.*

III. Commercial courses in secondar schools.

64. The limitations of any commercial course, *e.g.*, the course at the Central High School, Philadelphia, are recognised; "in no sense is its aim to turn out a 'finished business man,' but rather one so trained that he can quickly adjust himself to and be useful in commercial work. At the most the aim is to prepare boys for serving an intelligent apprenticeship in business houses." Pupils who withdraw at the close of the third year generally have to be satisfied with junior clerkships; those who complete the four years' course "are likely to enter upon a different sort of career." Some proceed to business colleges. Such curricula as these may serve as models; but the inclusion of special commercial subjects is comparatively valueless if the whole course of instruction is not made practically cultural; and that is a question, not of curricula, but of method. It is just the presence of this invaluable characteristic in American schools which gives the American of all classes so great a confidence in school education as a preparation not only for commerce, but for any walk of life.

IV. Business colleges.

65. No account of commercial education would be complete without some mention of that remarkable product of industrial civilisation, the so-called "Business Colleges" of America, if only on account of their large number. These are really schools destined to fit those who have completed a grammar grade or secondary school education for posts as clerks or accountants, etc. They give no general education, nor do they attempt to instil into their pupils the principles (if such exist) which underlie commercial operations. They instruct only in the technique necessary in a good *employé*. They could hardly find a place in a country like India which is mainly agricultural and where clerical labour is cheap (since they appear to aim at turning their pupils into labour saving machines). Nor have they escaped adverse criticism, largely, perhaps, on account of the picture of a specimen contained in "The Wreckers" (R. L. Stevenson and Lloyd Osbourne), which lays emphasis on their less desirable aspect. Nevertheless, Mr. Barclay asserts that they are the only business education that the American business man (so far as he has been able to ascertain) approves; *

* Reports of the Mosely Commission, page 396.

and I confess that I was greatly impressed with the example (one of the few "working exhibits" to be found in the Palace of Education) which I saw in St. Louis. This consisted of a class at work in a room fitted up to represent a counting-house. I saw exercises by the pupils in the "touch method" of typewriting. A letter was dictated rapidly and taken down in shorthand by the hearers, who then proceeded to reproduce it by means of Remington machines with blank finger boards, all fingers and both thumbs employed at once and the eyes fixed, not on the board, but on the shorthand manuscript. The rate attained is ten strokes per second. Errors in the work of the operators were very rare. A special pupil (of the Gregg School, Chicago) then typed a speech delivered with moderate rapidity, dispensing entirely with the shorthand stage. He also typed a letter dictated as fast as it could be thought out and spoken (I secured and have retained the result). The same pupil then wrote down in Gregg's shorthand a speech as fast as it could be spoken, and then on the black-board, blindfolded, another speech dictated at full speed. He subsequently read the speeches aloud. (Mr. Brown prefers the Gregg to the Pitman system of shorthand, as being better suited for the majority of pupils.) The whole class then did exercises in rapid reckoning, the method being demonstrated by two pupils who worked on black-boards, while the rest worked independently on paper. Columns of five or six numbers, each of three digits, were dictated at full speed and written down; no sooner was the last written than the operators at the boards wrote down the sum; the instructor called upon one or two of the others (who were not allowed to look up) to give the answer. Save in one case, the answers called always tallied with those on the boards. Bills were next dictated and written at full speed—320 lbs. of this article at 3½ cents. the lb., 85 lbs. of that at 16¾ cents., and so on to five rows. The operators at the boards had sometimes made each calculation before writing down the next; sometimes they made it while writing the next; and the total of the whole was written down almost as soon as the last item was calculated. I can only characterise the whole performance as astounding. Accounts are also taught with great care;

and Mr. Brown was good enough to show me the books on this subject which he finds most useful (see Bibliography). No stock-exchange is attached to these colleges; but each pupil is expected to conduct small operations with Packard's "Progressive Business Practice Budgets," and then, after receiving "college money," to launch into large transactions, each of the schools acting as a commercial centre for some particular commodity. Business correspondence is carried on between the schools; some bills of lading, etc., had arrived just as I visited the exhibit. Each pupil gets credit for his earnings in the College Bank. Caligraphy and the methodical exercise of the fine muscles of the fingers are insisted on. Mr. Brown informed me that he had established sixteen colleges in different parts of the States as a private enterprise; he has now formed the enterprise into a company. As many as five thousand pupils have attended these colleges in the course of a single year. "There are no strict qualifications for entry," he said in answer to my queries; "we take those whom we think fit, sometimes giving an informal entrance test if there is doubt as to a pupil's ability. We provide no general instruction, and reckon to turn out nothing but good clerks, copyists, stenographers, etc. I really doubt if we can call it education at all. Some people scoff at us as 'clerk factors.' Well, it may be true. But we are at least acting in accordance with the laws of political economy—we are supplying a demand. Our course may be narrow and meagre—I don't deny it. But our pupils get good employment before they have finished it. Last year barely four had time to graduate from our school at Peoria; all the rest had been snapped up before its conclusion. Can they rise higher than clerical labour? They have no higher general education than, say, the grammar grades; but if they have grit in them, they will get on. This is a country of self-made men."

V. Commercial continuation schools.

66. The last type which will be treated of here comprises those schools which are intended to continue the education of such as have been compelled to abandon school after the elementary or lower secondary grades and to enter business. These are continuation schools—held either during the day or, more generally,

in the evening. Those of Berlin have been described in Volume 9 of the Special Reports on Educational Subjects (Board of Education, Whitehall). They are intended to "turn the discontent of the slaves of machinery into the happiness of men conscious of their own success." Their popularity may be estimated from the fact that, in this city alone, they were attended by 32,887 pupils during the winter of 1902. The causes of this popularity are the free choice of courses, the free enjoyment of the preparatory courses without fee and the selection of teachers in each particular branch according to their ability therein and their power of adapting instruction to the needs of their pupils. In some towns of Germany attendance is voluntary; in others it is compulsory up to the age of sixteen or eighteen for *employés* who have not reached, or are not reaching, to a standard equivalent to the highest grade offered by the continuation schools. I have collected a few additional facts and opinions concerning them from the German exhibit. They are of three kinds:—

(1) General (*Fortbildungsschulen*), teaching general subjects, modern languages and a little of commercial subjects. A typical syllabus is:—German, French, English, commercial accounts, drawing, mathematics, stenography and type-writing; *or* chemistry, physics and commercial science may be included as alternatives.

(2) Special (*Fachschulen*), really trade schools, teaching an industry and generally no more.

(3) Commercial (*Kaufmännische Fortbildungsschulen*), which omit the study of German and mathematics, and are more purely technical, offering also a new foreign language. A typical syllabus is:—French, English, Russian, commercial arithmetic, accounts, simple and double entry, hand-writing, political economy, commercial law, stenography and type-writing.

As already remarked, attendance is sometimes compulsory; where this is not so, pressure is brought to bear on apprentices and *employés* through the guilds and through the hope of exemption from one year of military service earned by passing a State

examination in general subjects and two foreign languages. Fees are charged, but may be remitted in special cases. All these kinds of schools continue the work of the common school (*Gemeinde Schule*) after the age of fourteen. We are here chiefly concerned with the commercial schools. It may appear a fault in the syllabus sketched above, that the subjects (from which pupils can make any selection they like) are too technical. But this is not always so. In the schools of some towns, a suitable selection of readings is made, calculated to instil the principles of morality and patriotism; Freitag's "*Soll und Haben*" is recommended as a good book for this purpose.* To facilitate style, the composition of at least four essays a year is suggested. To enrich the power of expression, idiomatic forms are placed before the pupils, which can be used for various kinds of subject-matter. Since time to teach grammar, orthography and punctuation may be wanting, model lessons must be copied by whole classes with a view to improving style in correspondence, the pupils using the form only and supplying the contents out of their own business transactions. (I dwell on these more general recommendations because they appear to me of prime importance.) Two practical points may be considered. First, a supply of teachers, who are not mere tradesmen but also real educators, has to be arranged. In practice it has been found more desirable to take teachers of good general education and training; these can learn the technical part of their work more quickly than can the mere business man learn to instruct. Second, there is the question of time of meeting. The evening finds the pupil tired out with his day's work. Early morning or the period following the mid-day meal are recommended; and it is suggested that tradesmen will readily give their assistants leave of absence in those hours of slack business.

Application in India.

67. The types numbered II, III and V appear more or less applicable to India. Type II is possible of establishment in connexion with colleges, technical schools or high schools in industrial centres, for the benefit of those who have completed

* *Handbuch des deutschen Fortbildungsschulwesens*, Part 6, page 39.

a high or a middle school course. Type III is merely a modification of the high school course, and would form a branch in such a school offering bifurcated studies. Type V is applicable in both large and small industrial towns for the enlightenment of the lower classes—petty shop-keepers, railway servants, menials in Government or private service. I am acquainted with several evening continuation classes which have long flourished in India in quite unexpected localities. The subjects of instruction are general; were some technical instruction added, the classes might gain in popularity. But it must not be forgotten that a sound practical general education is a most important part of any scheme tending towards commercial enlightenment.

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## APPENDICES TO SECTION II.

### I.—A Simple lesson on Sound.*

Sound is formed in the larynx (locate the larynx) by contracting the vocal cords, so that the wind buzzes or vibrates against them (breathe with larynx open;—no sound is produced; then close larynx by contracting vocal cords; make children do this and feel difference). Illustrate by means of telegraph wires and wind buzzing against them; but show that vocal cords can also be accurately modified.

Hence, all speech sounds are produced :—

(1) with larynx more or less closed ("voiced" or buzzing sounds);

(2) with larynx open ("unvoiced" sounds).

Pronounce both kinds of sounds alternately, and let the pupils distinguish. Let them pronounce sounds individually and in chorus and close their ears so as to distinguish them better when they are uncertain. This is done first in the mother-tongue, then in simple words of the foreign language.

[In India, the difference between the characteristic mouth formations of English and Hindus would have to be shown. The English tongue tends to lie down in the mouth—to inertia; the Hindu tongue to differentiate sounds by extreme activity. Point out in this connexion the difference between English *o* and *ou* (as in *how*), and the Prakritic *o* and *ou* in which the tongue blade is elevated and reversed; also the difference between English and Prakritic *t*'s and *d*'s.]

The words "guttural," "labial," etc., should not be taught; but the teacher must give some simple name to the sounds (Vietor's system of nomenclature is suggestive but too complicated; *e.g.*, "lip-stop-voice-nasal sounds.")

NOTE.—(1) Dispense with the sounds of the mother-tongue as soon as possible.

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* Suggested by and condensed from Bahlsen's "New Methods of Teaching Modern Languages," page 50.

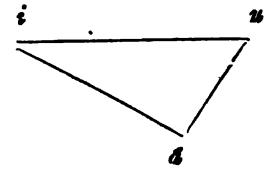
(2) Do not work by pronunciation only. Explain the organs; thus pronounciation is kept clear of faults.

Now draw the "Vowel-triangle" on the board, making the children see by pronunciation that the same tone in the larynx makes—

*u*, if we draw back the tongue to soft palate.

*a*, if the tongue lies idle.

*i*, if we draw the tongue up to the hard palate.




Next, show the intermediate vowels, as also the difference between close and open vowels, according as the tongue is more or less pressed towards the parts of the mouth. The repetition of the letters may be done in chorus, if the class is not too large; otherwise by groups.

Then show how the widening of the mouth first increases and then contracts in the series:— *i e a ɑ ɔ o u*, and how the lips are more and more protruded from beginning to end of the same series.

Explain that a diphthong is a combination of a vowel fully pronounced with one-half pronounced.

Show the same differences in short and long vowels, and emphasise the fact that short vowels are open as compared with long. Examples and symbols drawn from the mother-tongue must be abolished as soon as possible, and those from the foreign language substituted.* Give numerous examples, taking names on the map, objects in the room, etc.

Consonants may then be taken, and the children shown how, by approximation or contact of the organs of speech, the breath escapes

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* This presents a real difficulty in English, unless phonetic symbols are used, since there are not separate written vowels for all pronounced vowel sounds. Either words must be used, or section pictures of the mouth.

with a grating sound (fricatives or continuants), or with a bursting sound (stops or explodents). They should again be shown the difference between voiced (flat) and unvoiced (sharp) sounds, as illustrated by consonants.

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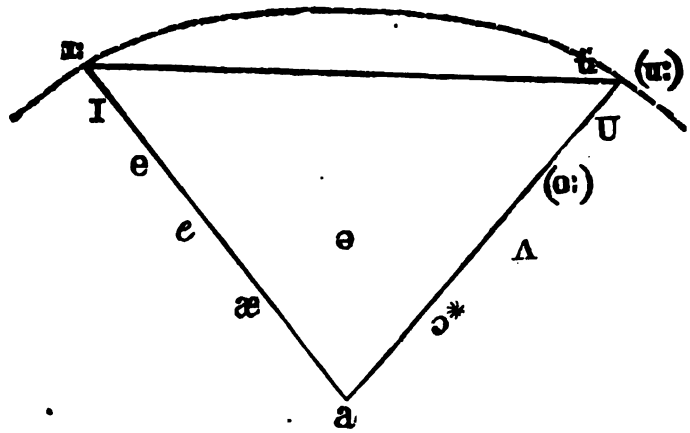
## II.—Outline of Vietor's Phonetic Scheme.

I.—*Vowels, i.e.*, sounds with mouth-opening.




[The dotted line represents the roof of the mouth, the top line of the triangle connecting the centre of the hard palate with the centre of the soft palate. The positions of the letters mark the positions of the articulating part of the tongue when pronouncing the vowel sounds indicated by those letters in the table given below. Small parentheses denote lip-rounding; a colon denotes length. Letters marked with an asterisk may be pronounced either long or short.]

(1) Sounded (*i.e.*, true) vowels.

(*a*) Guttural vowels—

(i) The *u*-sound. "The back part of the tongue is raised near to the soft palate, the fore part is drawn inwards and down." A resonance-chamber is formed in the fore part of the mouth; the lips are puffed forward, leaving a

small opening, and the rows of teeth are divided by a narrow opening.

1. u as in *too* ( = tuw).
2. ü as in *July* ( = dzüw'lai).
3. u: as in *cruel* ( = kru:əl).
4. ʊ as in *poor* ( = pʊ:ə).

[In the so-called "long *u*," *new* = njuw, *tune* = tjuwn, *value* = vœljü, *regular* = regjulə].

(ii) The *o*-sound (half way between *u*- and *a*-sounds).

1. o as in *no*, really a diphthong, of which the second part is toneless *u* (*ŭ*). Thus *node* = n(o:)ŭd, *note* = noŭt, *hotel* = hoŭ'tel.
2. o: as in *lord* ( = lɔ:d). Here the tongue goes farther down and deeper back than in *a*, and articulates against the uvula. It is identical with *a* in *all* and *war*, and with *au* and *aw* in *laud* and *law*. or = o:
3. o (short) as in *not* ( = nɔt), *October* ( = ɔk'toŭbə). But *lesson* = lesn.

[This also seems to be the first part of the diphthong *oi*, *oy*, as in *oil* and *boy*.]

(iii) The *a*-sound is the transition from guttural to palatal vowels. The articulation is a very slight raising of the middle back of the tongue.

1. a: (long) as in *father* ( = fa:ðə).
2. ʌ as in *nut* (nʌt).
3. ai and aŭ (diphthongs) as in *high* ( = haiə) and *how* ( = haŭw).

(*b*) Palatal vowels.

A.—Not rounded.

(i) The *e*-sound. Just as *o* is between *u* and *a*, so *e* is between *a* and *i*. The articulating part is now the middle and foreback of the tongue. The lip-opening and the angle of the jaw are less large than in *a*, and grow smaller

in proportion as the sound is removed from *a* and approximates to *i*.

1. æ as in *that* ( = ðæt).
2. *e* as in *care* ( = ke:ə ). This form has no corresponding *o*-sound.
3. e as in *let* ( = let).

(ii) The *i*-sound is to *u* as *e* is to *o*. The articulation consists in bringing the middle back of the tongue to the middle of the hard palate.

There is a tendency to draw in the lips.

1. i (with consonant j) as in *me* ( = mij) and *meet* ( = mijt).
2. I: (long) as in *fear* ( = fI:ə).
3. I (short) as in *fit* ( = fIt) and *myth* ( = mIþ).

B.—Rounded. These are not much found in English; but there is a guttural palatal:—

ə as in *turn* ( = tə'n). *Her and me* = hə ən mi:j.

(2) Soundless. These are vowels tacked on to preceding vowels so as to form diphthongs.

*II.—Consonants, i.e.,* sounds produced either by squeezing or stopping the outgoing breath in some part of the mouth or throat; in the former case they are called continuants, in the latter explodents. In the table given below, the consonants are for the most part shown in pairs, the first of each pair being voiced (flat), the second voiceless (sharp).

(1) Continuants.

(*a*) Guttural and palatal.

1. Uvula *r* (=ʀ), a "burr"-sound, not found in Hindi or normal English.
2. Guttural *g* and *x*. This is formed like the *u*-sound, but with greater elevation of the back part of the tongue. It occurs only in English "faugh!"; but may be pointed out as equivalent to the Persian *ain* and *gain*.
3. Palatal *y* and *c* (latter as in German *ich*, not found in English or Hindi. *y=j* and stands

to *i* as guttural *g* stands to *u*. Thus, *yes* jes, *due* = dju.

(*b*) Dentals are formed by pressing the tongue point or part of the blade (upper surface just behind point) against the roots of the upper teeth.

1. z and *ʃ*, as in *June* (=dzu:wn) and *vision* (=vizən); *rash* (= rœʃ) and *nature* (= neitʃə).
2. z and s. The tongue blade approaches the gums just behind the upper teeth; a hissing sound is formed by friction of the breath between upper and lower teeth as it is passed down the central lines of the tongue blade, as in *dances* (=da:nsiz) and *bakes* (= beiks).
3. ð and þ as in *thou* (= ðau) and *breath* (=breþ).
4. Liquids, *viz.*:—
   (i) Limited r (both flat and sharp), caused by bringing tongue point loosely against upper gums and causing it to vibrate, as in *parrot* (=pærət), *increase* (=in'krijs). But note:—*better and better* =bɛtər ən bɛtə.
   (ii) l (both flat and sharp), formed by placing tip of tongue against gum in centre, so that breath escapes on both sides of tongue, between it and cheek. *In English, the back of the tongue is raised, so as to give a guttural sound*, as in *felt* (=fɛl't).

(*c*) Labials, formed by pressing under lip against upper teeth.

1. v and f as in *liver* (=livə) and differ (=difə).
2. w and ʍ, a bi-labial formed by pouting both lips (*i.e.*, closing and then forming an opening between them) and raising the back of the

tongue, as in *w* sound. Thus *wet* =wet; *which* =ʍɪtʃ.

(2) Explodents. A stop is formed between back of tongue and more or less forward part of palate.

A.—Without nasal resonance.

(*a*) Guttural and palatal—

g and k, as in *egg* (=eg), *can* (=kæn) and *accuse* (=akju:wz).

(*b*) Dental. It is important to note that *in English not only is the point of the tongue pressed against the roots of the upper teeth, but the tongue blade covers a portion of the hard palate.* Thus the sound lies between the hard and soft *t*'s and *d*'s of Indian vernaculars. d and t, as in *adder* (=ædə) and *matter* (= mætə).

(*c*) Labials, formed by closing and opening the lips.

b and p, as in *babe* (= be:ib) and proper (=prɔpə).

B.—With nasal resonance.

(*a*) Guttural and palatal; the closure and opening occur between back of tongue and soft palate.

ŋ and ɲ. The former as in *singer* (=sɪŋə). The latter (sharp) does not occur in English, but in French, and in Hindi, e.g., *main*.

(*b*) Dental. The tongue articulation is as in English *d* and *t*, but the breath is slightly forced through the nose.

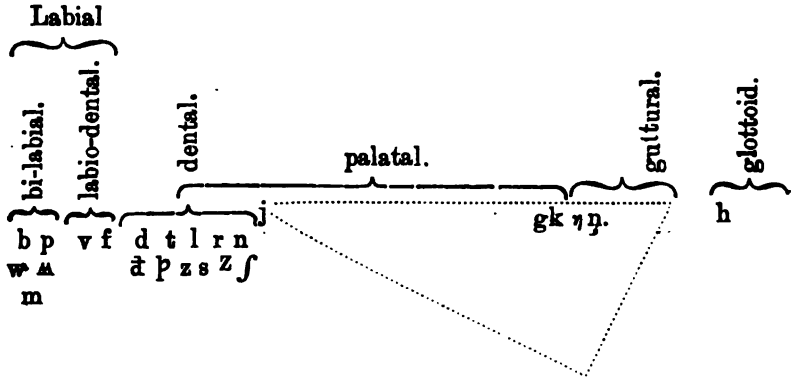
n as in *nine* (=nain). [It would here be necessary to distinguish between the two Hindi *n*'s.]

(*c*) Labial, formed by shutting and opening of both lips (hence bi-labial) and forcing breath slightly through nose.

m as in *my* (=mai).

Throat consonants are formed by emitting breath gently through glottis, while the vocal cords are sufficiently close as to cause friction. The example is the aspirate.

The pictorial consonant plan is given below:—




## III.—The Analytical-Inductive Method.*

The paradigms of words (in the foreign tongue) used in phonetic lessons (which occupy the first two weeks) can be frequently changed, so as to form a vocabulary—names of places, objects in the room, parts of the body. Expressions should be gradually introduced by the master, and need not be too carefully explained as regards grammar, etc.: "Give me your book," "Shut the door," "The lesson is finished," etc. These tend to make the foreign language the medium of instruction. The room may be decorated with English pictures, so as to give an environment. When pupils are tired of the lesson these pictures may be referred to as illustrating it and may be used to start a conversation.

In the third week a reading piece is given—easy but connected and interesting. One of the simplest forms (suitable to a *Real*-system) is to take striking personalities from the history of the people whose language is being learnt, and to tell little stories about them. Thus the children feel that they are not being imposed upon with mere nonsense. Show the man's portrait (speaking in English); show where he lived on a map. The piece is read thus:—The children have their books closed, and have not seen the

* Outlined from "New Methods of Teaching Modern Languages," by Doctor L. Bahlsen.

piece; the teacher reads a few sentences slowly, gives word meanings; reads again; makes the best pupils repeat; then the whole class repeats in chorus, till they have it by heart before they open their books and see it printed. Grammar is begun at the same time, by slight changes of person, number, etc. [Thus, to take an example common in Indian text-books, "You have made greater your guilt," becomes "I have made.....", "You have made .....", "the prisoner has made.....", these being written in sequence on the black board.] Declension may be shown in the same manner.

The articles, singular and plural forms of nouns, the possessives, etc., are shown. But not all the words of a piece should be grammatically treated. [At this point a "moderate reformer" will allow sentences in the known vocabulary in the mother-tongue to be taken home and retranslated. Victor's strict system, however, disallows this, and prefers that questions be asked on the text and answered by the children (all in English). The children may write down these questions, take them home and frame answers to them, sometimes writing these down.]

Accentuation of words is shown at the same time. [This is better than the *staccato* method of utterance employed in many Indian schools.] It should be done thoroughly with the first sentence of each lesson.

The children begin to appropriate new words and can recognise them in new connexions. Thus memorising of vocabularies is dispensed with. If a pupil's vocabulary is heard, this should be by means of sentences, not of isolated words. [Still, "moderate reformers" require vocabulary note-books to be kept by pupils, probably rightly—see paragraph 56.]

Greater care in vocabulary, spelling, etc., is now gradually introduced; and grammar is practised, though never by abstract conjugations, but rather by conversations, *e.g.*, "Where have you been?" "I have been to school." "And where has your brother been?" etc.

Writing work is postponed till after the pupil has begun the use of his text-book and knows some orthography. The first

exercise is dictation of the first piece read, which is now known to the pupil by heart. So it is mere orthography (as well as a lesson in hearing). The next dictation is the same lesson remodelled; the next the remodelled lesson with some new grammatical forms. Then questions and answers are dictated about the same lesson; finally, questions only, the pupils writing the answers.

This leads to questions less easy to answer, having reference to lessons read, to objects and maps in the room. Thus original composition is reached. *Retranslation from the mother-tongue is never given.* (If, however, such retranslation is required for examination purposes, the master may dictate *connected questions on the text* in the mother-tongue, to be answered in the foreign tongue. But these must not be like the disconnected questions of Meidinger, Ollendorf and Plötz.)

Poetry is important because of its beauty of form. But it must be merely memorised, translated into the mother-tongue, and rendered, if possible, into poetry of the mother-tongue. Difficult grammatical expressions, such as occur in poetry, must simply be taken for granted. Later pieces will throw light on the difficulties.

Classification in grammar must be avoided; irregular verbs must be conjugated piece-meal, as they occur. Carefully chosen pieces will make this easy, as well as giving good examples of verbs in connexion with auxiliaries. Whatever is linguistic and typical should be brought to the pupil's notice and stored up by him. We must no longer hold the pupil aloof from the irregular, but must plunge him into mid-stream.

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## IV.—The Berlitz Method.

A good idea of the method can be obtained by studying the works of M. D. Berlitz, its founder, *e.g.*, "The Berlitz Method for Teaching Modern Languages. English Part. First and Second Books." These volumes give a series of graduated lessons. The teacher is guided by these, though he does not stick slavishly to the book. Indeed, vivacity and resource are the mainspring of the system. Thus, I found the sixth lesson as delivered in the working

exhibit illustrative of the same points as the sixth lesson in the book, but not the same. As an example may be useful, I give in brief the outline of the lesson, as I heard it—

| | Question. | Answer. |
|---|---|---|
| 1. | Qu'est-ce que c'est ? | C'est le crayon. |
| 2. | Ditto | C'est la plume, etc. |
| 3. | Ditto | Ce sont les crayons. |
| 4. | Ditto | Ce sont les plumes, etc. |
| 5. | Les crayons de quelle couleur sont-ils ? | Ils sont noirs, etc. |
| 6. | Les crayons sont-ils sur la table ? | Ils sont sur la table. |
| 7. | Ditto ditto | Non, ils sont dans la main, etc. |
| 8. | Qu'est-ce que c'est ? | C'est le crayon. |
| 9. | Ditto | Ce sont les crayons. |

Three other points were then inculcated—the use of *aussi* and of *si*, comparison of adjectives by comparing sizes, etc., of objects, and the proper person to be used after such expressions, as *ma sœur et moi*. Finally came the conjugation of verbs (*porter, mettre* and *prendre*, in the present tense; thus :—

| | | |
|---|---|---|
| 10. | Prenez le livre ! | Je prends le livre. |
| 11. | Que faites-vous ? | Je prends le livre. |
| 12. | Que fais-je ? | Vous prennez le livre. |
| 13. | Que fait-il ? | Il prend le livre. |
| 14. | Que faites-vous ? | Nous prenons les livres. |
| 15. | Que font-ils ? | Ils prennent les livres. |

Each question is accompanied by the appropriate action on the part of the teacher. The class answers in chorus; but, if the answer does not come immediately, the teacher does not hesitate to give it, the pupils repeating several times after him. When a new idiom comes in, as in the answer to question 3, he invariably gives the answer. Of course the pupils kept on saying *ces* instead of *ce*, and had to be several times corrected. Again, question 9 was a catch, and half the pupils said *ils*, till corrected.

Pronunciation is attended to, and the teacher often addresses a single pupil, requiring the answer only from him or her. An important point is that no preparation of the lesson is allowed. But the pupils have the book of lessons, and, when each recitation (or, rather conversation) is ended, they copy it out. This (together with the writing up of new words and expressions on the black-board)

initiates them into spelling. As for grammar, it is taught inductively; but the answers to questions 11 to 15 are written up at once on the board.

An account of what the system professes to accomplish in 150 fo 200 brief lessons is indicated below (with reference to pupils learning French).

PROGRESS MADE BY A PUPIL THROUGH BERLITZ SYSTEM IN 150—200 LESSONS.

*First Book* (of some 100 pages, with illustrations).

The pupil can name objects, their colours and dimensions; can compare them, can affirm and deny; can employ the verb *être* in the singular, and some prepositions.

He employs the rules of motion in the singular, as also the verb *avoir*; he knows how to count; he uses all the foregoing in the plural.

He knows the names of articles of clothing, the possessive adjectives and ordinal numbers, is acquainted with the alphabet and knows the verbs *lire* and *écrire*.

He passes from the concrete to the abstract (*pouvoir, vouloir*, etc.), understands the gerund and the infinitive, as well as subordinate prepositions (cause, purpose, conditions).

He uses the verbs *donner, envoyer, dire*, etc., and the indirect object; he also speaks about the functions of the five senses.

He makes himself understood at meals, speaks of eatables, beverage, flowers; of tastes and odours; of beauty and lightness; of what he does and does not like.

He knows the divisions of time; the names of substances, of materials; the possessive and demonstrative pronouns.

He speaks of day and night, of the stars; of the lighting and heating of houses; of fine and bad weather.

He is acquainted with the past tenses of verbs.

He also knows the future tense, and employs the relative pronouns.

He speaks of plants, of animals, of man; of the physical life and of the mental functions; he knows the usual expressions of feeling.

He can converse about the family relationship; about invitations journeys, and different countries.

Having arrived in a city, he is driven to an hotel; arranges about his lodging, his meals and purchases; he discusses prices.

While promenading, he gathers information, pays for purchases, gives orders. He now writes letters. He is familiar with the agreement of the past participle.

*Second Book* (150 pages, without illustrations).

His vocabulary, now more complete, enables him to talk of instruction. He can look for, visit and engage an apartment, discuss the conditions of its lease and furnish it according to his taste.

At tailor's, dress-maker's, furnisher's, etc., he chooses what he wants and gives his orders without difficulty.

Additional idiomatic expressions render his social intercourse easy and agreeable. He makes calls on friends, and can speak with them on different subjects. He can converse about doctors, maladies and drugs.

He describes winter and spring, easily finding the proper expressions. He speaks of the pleasures of winter, the joys of spring.

He describes summer and autumn, country resorts, sea-bathing, field labour, fruit gathering, gardens, orchards.

Being well acquainted with the past tense, he uses it for descriptions, and for speaking of customs of the past.

Little by little he arrives at shades of meaning. From reality he passes to hypothesis and employs the conditional.

He has now reached the subjunctive and is able to employ it as required, either in expressions of sentiment or will, or in connexion with conjunctions.

The subjunctive has now become familiar to him. He employs it after impersonal, and in relative, propositions.

From conversation he passes to narration. He distinguishes between the *Passé indéfini* and the *Passé défini*, and uses the *Imparfait descriptif* in the narrative.

He no longer confuses the tenses of the past; narration, recital, description, information—no shade of meaning escapes him.

Capable of employing all tenses and moods, he now enriches his vocabulary by reading short anecdotes which render him familiar with a number of idiomatic expressions.

After having acquired practical knowledge of the language, he now begins the theoretical study of grammar, and perfects himself in its application by reading the masterpieces of literature.

# III.—PHYSICAL LABORATORIES IN GERMANY.

BY

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# PHYSICAL LABORATORIES IN GERMANY.

UNDER the system of furlough studies instituted by the Government of India I was placed on special duty to inquire into:—

(1) The methods adopted at the Universities and Polytechnics of Munich, Berlin, Vienna, and other prominent Universities and Technical institutions in Germany, with regard both to the ordinary study of physical science and to the character of the investigations and the system pursued in the case of students who are entering upon a course of independent research.

(2) The construction and equipment of modern German laboratories, the special merits of scientific instruments of German manufacture, and the facilities for standardizing these instruments, which are offered at central institutions in Germany.

I was engaged in these inquiries for six weeks, from the middle of October 1903, when I received my orders, until the end of November, when I was obliged to embark for India. As far as the time allowed, I endeavoured to carry out the objects of my deputation.

2. In the course of my tour I visited the Universities of Vienna, Graz, Berlin, Leipsic, Halle, Marburg, Munich, Freiburg, and Strassburg, and the Technical High Schools of Vienna, Graz, Berlin, Hanover, and Karlsruhe. I likewise inspected the scientific workshops of Toepfer and Son at Potsdam, Schmidt and Haensch, Berlin, Hartmann and Braun, Frankfort, and Dr. Edelmann,

Munich. With regard also to one or two other institutions which I was unable to visit, I obtained information bearing on the subject of my report,

## METHODS OF STUDY, ETC., AT UNIVERSITIES AND TECHNICAL HIGH SCHOOLS.

Ordinary instruction in physical science.

3. Under this head are included ordinary instruction in physical science through lectures, laboratory work, both elementary and advanced, and also the courses of study necessary for a diploma or degree. I may here premise that in all the points to which I gave my attention I particularly bore in mind the question of their bearing on the University system in Bengal, and that consequently in the course of this report the latter will occasionally be referred to for the purpose of comparison.

Difference between universities and technical high schools.

4. The study of physics in the technical high schools differentiates itself from that in the universities in so much that in the former it forms only a part of some complete course of technical training, while in the latter it is for the most part pursued as an independent branch. In the technical high schools the students are allotted to different departments according to the professions for which they wish to qualify. In the more highly organized institutions of this kind there are, for instance, separate courses of study for civil engineers, mechanical engineers, maschinen-ingenieurs (not, however, quite what is understood by mechanical engineer in England), electrical engineers, architects, surveyors, and chemists (chemiker). Though all of these have to attend a course of lectures on experimental physics, only the electrical and mechanical engineers and the chemiker are required to do practical work besides. Till quite recently no advanced or research work in physics was done by students in technical high schools. Within the last few years, however, those institutions have been raised to the rank of universities, and have had the privilege conferred upon them of bestowing the title of Doctor on their alumni, the same title as is given by the universities. To attain this, however, it is necessary that the student should have completed some original work in the subject which he selects, and to this work he can only devote himself after he has finished the full course of five years prescribed for his technical training.

It follows that, as very few students are in a position to spare the additional year or two required for this "arbeit," they are compelled by circumstances to apply themselves without further delay to the profession for which they have so far qualified. Even those who are more fortunately placed than their fellows generally select a purely technical subject for their theme, so that, as far as physics at least is concerned, very little advanced work is likely to be done even in the future in technical high schools.

5. In the universities, on the other hand, conditions are different. There the degree of Doctor is attained by proficiency in some one special subject. A student who takes up physics has practically nothing to divert him from his special studies during the four or five years over which his university career usually extends. It is true that he is required to attend a certain number of lectures in what is known as the philosophical faculty, but outside his own subject nothing is asked from him but a certificate that he has paid the required fees, and he naturally chooses the lectures which have more or less bearing on the study of physical science. Other classes of students are of course also provided for in the university physical institutes. The lectures, for instance, will probably be attended by those who take up some other branch of science for their Doctor's degree, as well as by students in other faculties who, from inclination or for some other reason, choose experimental physics as one of the seven or eight courses of lectures in the philosophical faculty which the regulations require them to attend. A laboratory course will in addition be taken by those whose special study is more immediately connected with physics, such as students of chemistry or of medicine. The study of practical physics is likewise enjoined in the case of students qualifying for a higher grade State teachership in the section of "Mathematics and Physics." The essential point, however, of the physical institute of a university is that it is designed to meet the requirements of students whose ultimate purpose is the carrying out of advanced work or the prosecution of original research in physical science. It is the needs of these particular students, few though they be in number, which determine the character of the institute and make it necessary that

it should be much more elaborately constructed and equipped in the case of a university than in that of a technical high school. The same holds good of the lectures as well which are consequently much more numerous and varied in the former institutions than in the latter.

Lectures. 6. With regard to the instruction itself, this is given partly in lectures, partly in the laboratory. In every case one complete course of lectures in experimental physics extending over the winter and summer sessions is given by the senior professors. These lectures follow the ordinary lines, but are so far original that they are drawn up by the professor himself and are not founded on any particular text-book. Though the professors are all men of distinction in physical science, some have naturally a greater aptitude for exposition than others. Some again develop their lectures more fully on the experimental side, while others incline more to theory. Professor Lehmann, for instance, at Karlsruhe reduces his actual discourse to an absolute minimum. The results and data of his experiments are written out on the blackboard beforehand, while the experiments themselves are conducted on such a large scale that he dispenses altogether with the usual lecturing table, the whole floor-space at his disposal being covered with trap-doors, which provide communication with powerful engines below. Though there is, therefore, considerable variety among the lectures at the different institutions, they all enjoy this common advantage that the theatres in which they are delivered are fully equipped with the appliances necessary for experimental illustration, and that the collection of instruments required for the same purpose is complete in every respect. Besides this course of experimental physics, other lectures are delivered either to special classes of students or on special subjects. These additional lectures are naturally less numerous in technical high schools than in the universities where the subject of physics is more specialized and the number of lectures correspondingly greater. The lecturers are divided into professors, ordinary and extraordinary, and "privat-dozenten." The latter consist of distinguished graduates, who qualify for the title of "privat-dozent" by the delivery of a course

of lectures on some special subject, and who are entitled in virtue of their title to lecture from year to year, without, however, any remuneration other than that obtained from fees. The number of separate courses of lectures depends of course on the size and importance of the institution. In Berlin University, which is the largest in Germany, no fewer than eleven different courses of lectures are being given in the present winter session 1903-1904 on physical subjects, while in Marburg, one of the smallest universities, there are only three. In the same way in the celebrated Technical High School at Charlottenburg in Berlin the number of different subjects on which lectures are being given is seven, while at Braunschweig, the smallest technical school in Germany, there is merely one complete course on experimental physics. To illustrate the variety of the subjects lectured on, the current list for Berlin University may be here quoted :—

| | |
|---|---|
| Professor Warburg . . | Experimental physics. |
| „ Planck . . | Mechanics. |
| „ Krigar-Menzel . | Theoretical physics. |
| „ Weinstein . . | The principles of Thermodynamics and |
| „ V. Wesendonck . | General Thermodynamics. |
| „ Lummer . . | Light and Heat radiation. |
| „ Pringsheim . | Interference and polarization of light. |
| „ V. Bezold . . | (1) General meteorology.<br>(2) Wind and weather. |
| Dr. Starke . . . | Electric waves. |
| „ Martens . . . | Electric and magnetic measurements. |
| „ Nessen . . . | Kathode, Röntgen and allied rays. |
| „ Meinardus . . | Meteorological instruments and observations. |
| „ Less . . . | Introduction to climatology. |

7. These lectures represent, as the titles show, a greater or less degree of specialization. The more general subjects are repeated from year to year, but with regard to the highly specialized courses the lecturers generally select new subject-matter every term for any course they may wish to deliver. In no case is there a mere expounding of text-books; a complete course of lectures is given drawn up by the lecturer and more or less original according as the subject is of a more or less special character. One point with regard to the whole system of lecturing may here be particularly noticed, as a useful lesson may be drawn from it. Lectures upo

each subject are given in common to students of all years, not, as in the Calcutta colleges, to the students of each year separately. To introduce a distinction between the students of different years when a lecture on a particular subject is given, is simply to double the amount of work in a college. It is true that the limited size of the physical science theatre might militate against the introduction of the system indicated in the Presidency College, Calcutta, for instance, but it is hoped that within the next few years a building more suitable for the teaching of physical science than the present one may be erected in connection with that institution.

Practical work.

8. Passing now to the instruction in practical physics, to which perhaps more importance is attached than to the lectures, we find in the first place that the class of students for whom provision has to be made is considerably narrowed down. In both the technical high schools and the universities there is a complete course of practical physics called the general praktikum. This course is attended in the former by the students of electrical engineering and those of chemistry, in the latter by those students who take either physics or chemistry as their special subject. Candidates for the post of Government teachers in what might be called secondary schools are likewise in both institutions not only required to go through this general praktikum, but have to extend it beyond the ordinary limits so as to include a number of more advanced exercises. Further, in the universities there is usually a separate course of a more elementary nature for students of medicine. The scope of work which is comprised in this general laboratory course is very similar at all the universities and technical high schools, but as in the case of the lectures, the spirit which animates the whole depends largely on the professor who has the direction of the institute. In some cases I noticed considerably more method and order in the conduct of the work than in others, and with this greater method and order I noticed likewise a correspondingly greater respect for and deference to authority. Though there is the most absolute freedom in German universities and nothing can be done to make a student work if he does not wish to, still where method and order prevail, discipline, even if it cannot be actually enforced, follows to a large extent in their wake. (In the technical high schools, of course, a

greater amount of discipline exists than in the universities, as might be inferred from what has before been said of the comparative organization of these two institutions.) Where there is a good system, students after a short time either drop out altogether or make up their minds to work in accordance with that system. Leipsic and Marburg are both good illustrations of this principle, and I have appended their respective schemes of work in practical physics, to show how, even where perfect freedom otherwise exists, the presence of the mere idler may by effective regulations be rendered impossible. I have also appended the syllabus of exercises which are usually gone through in the ordinary praktikum not only for these universities, but also for that of Freiburg and the Technical High School at Berlin. It will be seen from these that the most elementary course, the one, for example, which is prescribed for medical students, may be finished in one term (semester), *i.e.*, about five months. A slightly more advanced course such as is, for instance, taken by students of chemistry, requires at least one year. Not less than one other term is needed by those who are preparing for the State examination for teachers, while finally those students who make physics their special subject and who intend to graduate therein generally extend their work in the ordinary praktikum to two years. The practical classes are conducted by assistants or demonstrators—themselves ex-students of marked ability—the number of whom depends on the size of the class, while the whole is under the general supervision of the professor. From the following figures an idea may be obtained of the relative proportion of assistants to students:—

| | |
|---|---|
| Vienna university | About 70 students in 3 divisions, each division under 2 assistants on two afternoons in the week. |
| Vienna technical school | 25 students under 1 assistant. |
| Graz university | 12 students, 1 assistant. |
| Graz technical school | 11 students, 1 assistant. |
| Leipsic university | 140 students in 2 divisions, each under 3 assistants. |
| Berlin university | 140 students in 2 divisions, each under 3 assistants. |
| Berlin technical school | 300 students in 4 divisions, each with usually 3 assistants. |

| | |
|---|---|
| Halle university . . | 70 students, of these 25 medicals are taken separately, the remaining 45, two after noons in the week under 2 assistants. |
| Hanover technical school . | 47 students under 2 professors. |
| Marburg university . . | 79 students in 2 divisions, each under 2 assistants. |
| Karlsruhe technical school . | 200 students in 4 divisions, under 1 professor and 1 assistant. |
| Strassburg university . . | 40 students under 2 assistants. |
| Freiburg university . . | 36 ordinary and 8 medical, the former in 2 divisions, each under a separate assistant. |

As a rule, the students work separately; in one or two cases, however, they were divided into pairs.

It will be gathered from the above that the average proportion which obtains is about one assistant to 22 or 23 students, not taking into account the professor who is as a rule present during the practical class and ready to give assistance when this is required.

Though no text-book is prescribed, all students are expected to furnish themselves with Kohlrausch's hand-book on practical physics, which forms the basis of their work, being probably the most exhaustive existing treatise on the subject.

Advanced work.

9. Such is a brief description of the conditions under which the ordinary practical classes are conducted at German universities and technical schools. Passing now to the advanced or original work carried on in these institutions, it may be noticed in the first place that with the exception of the work done by the members of the teaching staff themselves, this is practically confined to the universities. It has already been noticed that the compulsory work in the case of the students attending the technical high schools extends over so many years that very few can spare the additional time required for the attainment of the title of Doctor. At any rate, up to the present no provision has been made for such students in technical schools, while on the other hand the physical institutes in the universities exist largely for the benefit of the candidates for the degree of Ph. D., a necessary condition for which is the elaboration of a dissertation on some piece of original or quasi-original work. The immediately following remarks refer therefore exclusively to the latter institutions. Students who take up physics for their Doctor

degree are required to go through a much more complete course of practical physics than the ordinary as a preparation for their final work. The following may be stated as the usual apportionment of their years of study: one year's preliminary attendance on the course of lectures on experimental physics, a two years' exhaustive practical course and two years' work (or even more) on the subject selected for their dissertation. I would specially call attention to the fact that students are discouraged from commencing the final stage of their labours before they have been thoroughly trained in practical manipulation, and have carefully gone through a complete course of laboratory work, such as is represented, say, by Kohlrausch's very elaborate hand-book. In this way, besides acquiring a comprehensive knowledge of practical methods in all branches of physics, they are enabled with the help of an additional study of the literature of the subject to learn where the boundaries of knowledge in this division of science lie, and what are the problems still awaiting solution. It is only with such maturity of study that a student can be expected to show moderate judgment in the selection even of the mere direction of his subject of research, and to work with a reasonable amount of independence after he has commenced his investigations. As a matter of fact, students at German universities rely for the most part on their professors for a choice of subject, though no objection is made to their selecting the general field in which they wish to work, or even some special portion of that field, provided their choice is a sensible one and holds out a reasonable prospect of fruition. These points are here noticed partly because they have a bearing on the question of the research scholarships, which have recently been instituted by Government in connection with the Presidency College in Calcutta. At present the only preliminary training which the research scholars receive is the practical course which they go through in preparing for the M.A. Examination. This may fairly be compared with the one-year ordinary course at a German university which has been alluded to above, and is therefore quite inadequate as a preparation for the independent work which they are supposed at once to embark on. Until the existing scheme of practical work leading up to the M.A. degree is remodelled, research students ought most certainly to spend the first of th

three years for which they are appointed in acquiring a fuller knowledge of laboratory methods than they can possibly have derived from the course prescribed for their degree. Any attempt to rush into research work immediately at the outset must inevitably result in the student's three years being spent to very little purpose, not to speak of his being entirely dependent during the whole of his term on the professor under whose guidance he has been placed. Should, however, as it is hoped will be the case, a proper scheme of practical work be adopted within the next few years for the B.Sc. degree, a more advanced course may then be prescribed for the next higher degree, corresponding to the present M.A., so that a student who has successfully passed the examination for the latter will be quite competent to enter on research work at once.

10. The number of those engaged in advanced work varies at the different German universities, but is in no case very large. It depends not only on the importance and numerical strength of the university itself, but also on the individual reputation of the professor who is in charge of the institute, as well as the accommodation and facilities which the latter offers for original research. The largest number of students I found doing original work was at Berlin, where there were thirty. This is, however, altogether exceptional, the nearest approach to it being twelve in the case of Vienna. In the case of the other universities visited the numbers varied from two at Graz to about nine or ten at Leipsic and Munich, so that the average number may be taken as five or six. Each student had, as a rule, a separate room allotted to him, but at Berlin, owing to limited accommodation, two students frequently had to work in the same room. The students are encouraged to work as far as possible independently, but periodical visits are made by one or other professor to see what progress is being made, to assist and advise when difficulties arise and generally to make suggestions with regard to the methods adopted by the student in his particular investigation. There is naturally a great difference between the amount of assistance required by individual workers. Some show almost complete self-reliance, whilst others again refer to their professors for advice on even the most trivial points. There

is also a certain amount of difference in the degree of control exercised by the individual professors. In a large number of cases the students are employed on investigations intimately connected with the branch of research on which the professor is himself engaged. In such cases the latter naturally takes a more immediate and active interest in the progress of the work. On the other hand, where the subject is self-selected (which often happens with foreign students) or when the subject, though chosen by the professor, does not belong to his own special sphere of investigation, the control exercised is of a lighter description. In all the universities, however, which I visited the professors were agreed that the supervision of students doing independent work formed the hardest part of their duties. It was pointed out to me that, once a subject had been selected, it was essential that the professor should make himself thoroughly conversant with the literature of all the work that had been done up to date in that special line of research. It was also necessary that, while the details of the work were left to the student, the methods employed by the latter should be carefully scrutinized. The credit of every university requires that in any work issued with its sanction none of the previous investigations in the same field should be ignored, and further that the processes employed should be not only free from actual error but also of such a character as to show a sound knowledge and intelligent appreciation of physical methods. It will be seen therefore that the responsibility and actual work devolving on the professor are by no means inconsiderable, especially if he has a large number of students working under him. So much indeed is this the case that some professors specifically limit the number of research students. Professor Himstedt of Freiburg, for example, never has more than three working at the same time. On the other hand, there are one or two professors with encyclopædic knowledge on whom the work of supervising many different lines of research seems to sit more lightly. Professor Warburg, of Berlin, has apparently no difficulty in guiding the researches of his thirty students, among whom he makes a regular round of visits every morning.

11. An idea may here be given of the class of work on which students are engaged. The following list of subjects is, however,

only selective, partly owing to my visits having taken place at the beginning of the session when many of the advanced students had not yet commenced work:—

| | |
|---|---|
| Leipsic . . | Measurement of diffused light in dust in different directions with a specially constructed photometer. |
| | Refraction through metals drawn out into molecular films. |
| | Absorption of Hertzian waves. |
| | Investigation of a possible change of potential through impact of cathode rays in a vacuum on a small plate of aluminium at different angles. |
| | Examination through the spectrograph of metallic films obtained by deposit from cathode electrodes. |
| Berlin . . . | Absorption of ultra-violet radiation in ozone. |
| | Ozonisation and de-ozonisation of oxygen acted on by ultra-violet light. |
| | Absorption and reflection of cathode rays. |
| | Investigations with regard to elasticity at the temperature of liquid air. |
| | Investigation of the ultra-red portion of the spectrum. |
| Halle . . . | Advanced work chiefly on the diffusion of gases; viscosity of argon, and helium. |
| Marburg . . | Magnetic properties of iron-free alloys of manganin. |
| | Determination of the ratio of the specific heats for ozone. |
| | The exhibition of lines of force in dielectrics. |
| Freiburg . . | Absorption of the emanations of radium and similar substances by different fluids. |
| | Manifestation of radio-activity by air through which a stream of water has passed—its absorption by liquid air. |

Colloquium.

12. Before leaving this part of the subject one very important feature in the training of the research student must be mentioned, *i.e.*, the institution which goes by the name of colloquium or seminarium. The form which the colloquium takes varies slightly at some of the universities, but on the whole the character which it finally assumed under Professor Kohlrausch is now recognized as possessing the greatest educational value. As at present constituted, it is simply a meeting at certain fixed periods of those members of the universities who are interested in physical questions, such as the professors, the "privat-dozenten," the assistants

and all the students who are engaged in advanced work. Until a student has reached this stage, he is not admitted. Some recently published physical work with the accompanying experiments is reproduced (generally by a student), and free discussion and criticism follow. The advantages of such an institution lie not only in the invaluable training which it affords to the reader of the paper himself, but also in the presentation and interchange of opinion with respect to the most recent work in physics. Its value is indeed inestimable, and the introduction of the system, wherever there is a sufficient number of students and others interested in physical research, cannot be too warmly advocated. In the older form the paper generally dealt with some original matter on the part of the author—say the subject of his thesis for the degree of Doctor; and such original papers are still included in the colloquium at a large number of the universities. There can be no question, however, as to the greater benefit arising from the mere reproduction of the most recent work done elsewhere, not only on account of the larger field for selection which it offers and the unique opportunity which it affords for becoming directly acquainted with the latest developments of physical science, but also on account of the freer and more searching criticism to which a paper would naturally be subjected, when the writer is not directly responsible for the matter contained therein.

## CONSTRUCTION AND EQUIPMENT OF MODERN GERMAN LABORATORIES, ETC.

18. Leaving now the methods of tuition, I pass on to the remaining part of my report, *i.e.*, the construction and equipment of modern German laboratories, the special merits of scientific instruments of German manufacture, and the facilities afforded for standardizing these instruments. The construction of a German physical institute embodies to a large extent the ideas of the particular professor to whose initiative its erection was due, as the German Government has invariably given the latter a free hand, subject always to limitations of cost. Though a certain individuality is therefore noticeable in the institutes of the various universities—and to these, for reasons already enumerated, I propose to confine my remarks—

there are one or two characteristic features which are reproduced in all the more modern ones, and it is to these common characteristics that I chiefly wish to call attention, as likely to find useful application in any scheme for laboratory construction which may be brought forward in India. Austria, I may state at once, is most unaccountably behindhand in the provision of properly designed physical institutes for its universities. In the whole of the country there is only one, and that, strange to say, is not at Vienna, the imperial capital, but at Graz, the chief town of the province of Styria. The institute at Vienna is unworthy of the university, which for the celebrity of its professors and the numbers of its students is among the very foremost in Europe. The delay, however, which has taken place in providing the capital of Austria with a more adequate domicile of physical science is attributable not so much to Government as to the fact that the three senior professors of physics are all possessed of exactly equal authority. Progress in undertakings of this kind is naturally much quicker where, as in Germany, they represent the ideas of an individual only, or where the latter has at least the final decision in cases of difference of opinion. That the Austrian Government is anything but parsimonious with regard to its educational institutions is shown by the fact that it has at the cost of £60,000 just erected in Vienna an electrotechnical institute which, both in construction and equipment, is a model of its kind. It has likewise assigned a piece of land and £25,000 for the construction of a physical institute, so that perhaps in the course of a few years, a building more worthy of its purpose than the present one may be called into existence. But if the institute at Vienna is inadequate, the one at Graz is in every way admirable. I have appended the complete plans of this building as well as those of Strassburg and Leipsic, which are the most noteworthy of the German institutes which I visited. I have also added Giessen and the Staatslaboratorium at Hamburg, which I did not personally inspect. Of these Strassburg, though not of very recent construction, has long served as a model for similar institutions on the Continent of Europe, while Leipsic, which is not yet quite finished, embodies some of the latest ideas in the general

construction and detailed arrangement of buildings intended to form an abode for physical science. Leipsic is built on a large and expensive scale; Giessen, which was finished in 1899, is, on the other hand, a perfect example of a physical institute of a smaller and less pretentious type. Hamburg again is interesting as showing how a physical and chemical laboratory for purposes both of instruction and research can be combined in one building.

14. Though these and others which I visited show certain individual characteristics, yet there are, as already stated, some important features common to all. The cellar-floor, which is in greater part below the level of the ground, is reserved for machine-rooms, accumulator-rooms, workshops, and perhaps also rooms where a constant temperature is a desideratum. On the parterre-floor which is slightly raised we find always the rooms set apart for research work, where extreme precision is necessary. For this it is essential that all vibrations should be reduced to a minimum. Formerly this was secured by building isolated pillars with separate foundations in these rooms, but recently better results have been obtained by simply making very strong floors resting on arched foundations. In either case the necessary conditions cannot be satisfied on any floor higher than the ground-floor. It is impossible over the greater part of India to utilize cellar-rooms owing to the excessive moisture, and the impossibility even with the most perfect precautions of preventing penetration of the sub-soil water. Even in Germany the area-floor was, after construction, found to be too moist in some cases. Thus in Graz, where the institute was built on the site of an old swamp, it was found impossible to use the cellars for the purposes which they had originally been intended to serve, and several of the rooms on the ground-floor had accordingly to be encroached on. It follows therefore that in India, unless the area covered were very extensive, the ground-floor would have to be given up to workshops, accumulator and machine-rooms, and to rooms for advanced work in which great accuracy is a *sine qua non*. Apart from these rooms, the institutes, whatever be their special features, generally contain a large lecture-theatre with an adjoining preparation-room, a smaller lecture-room, chiefly for theoretical physics, and a large hall for the collection of instruments; further, a spacious laboratory with the

addition perhaps of one or two special rooms for optical and electrical work to serve the general practical instruction of the students, and lastly besides a room for the private work of each of the professors a number of smaller rooms for the research work of students and others. The number of the latter varies with the relative importance of the institution and the funds available, but in every case they include one room especially designed for optical purposes. Individual institutes, especially if the funds allotted for their construction are ample, may present certain additional features such as rooms free from iron for magnetic work as in Graz, Leipsic, and Strassburg, rooms for constant temperature, rooms for experiments on a large scale as in Leipsic and Munich, a tower for astronomical and other purposes as well as in many cases a residence for the Director, but the essential requirements are those which I have indicated above, and in every instance provision is made for these before claims for further elaboration on special lines are taken into consideration.

Lecture-room.

15. With regard to the details of the building, the large lecture-theatre is found indifferently on the ground or the first floor; in either case, however, not only the preparation-room, but also the large hall for the collection of instruments, adjoins it for the sake of practical convenience, so that the floor-space occupied by this combination is of considerable extent. Further, almost all the lecture-theatres of recent construction have their light admitted from the roof, so that, unless, as at Charlottenburg and Freiburg, the present lecture-theatres form special annexes added to the older block, we find that in the more modern institutes the theatre is situated on the first floor, its height of course extending through two stories to the roof of the building. As a properly arranged lecture-theatre is regarded as one of the most important features of a physical institute in Germany, I propose to go into some detail with regard to the design of those examples which I had the advantage of inspecting during my tour. The largest auditorium was that at Charlottenburg, which seats about 500. Freiburg occupies an intermediate position with accommodation for 260 students, whilst Giessen, one of the smaller universities, possesses a lecture-theatre seating 120. All these are of quite recent construction and

may be taken as representing the latest ideas in buildings of the type under discussion. The auditorium has a much gentler slope than was common in lecture-rooms of the older kind, the inclination increasing towards the back of the hall. This enables those who are seated in the highest rows to obtain a much better perspective of the experiments than was possible when they were, as formerly, perched high above the lecturer's table. An increase in the seating accommodation is obtained by making the room broader rather than deeper. The seats are either arranged in straight rows or in a slight curve; the latter seems more advantageous when the number to be seated is large.

16. As already stated, the room is usually lighted from above, one common arrangement being for the light to pass through a plate of dulled glass, surmounted by a glass dome. In the older form which has been adhered to in the new electrotechnic institution at Vienna, there is a double tier of windows, a balcony round three sides of the room on a level with the top of the auditorium dividing the upper from the lower tier. In some cases there is a combination of the two systems, the illumination from the top being supplemented by side-windows. Where the former system prevails, the darkening of the room is easily effected by simply unwinding a sheet of cloth impervious to light so as to cover the transparent roof. Where there are windows, a simultaneous winding arrangement enables the room to be promptly darkened, and in both cases the system is actuated either by a hand-wheel or by an electric motor.

17. The lecturer's table is fitted with every convenience for experimental demonstration. It ordinarily consists of two portions connected by a removable board in the centre. Besides the usual water-tanks and connections for gas and electricity, there are also pipes running round the table with a number of outlets for both rarified and compressed air. In Giessen there is the additional convenience that the table rests on castors, so that, after the various connections have been unscrewed, it can be completely removed. In all lecture-rooms there is always a considerable space between the table and the auditorium, and the floor is here provided with various trapdoors under which there are outlets on a larger scale for gas

water, rarified and compressed air, the latter both at high and low pressure.

18. There is the usual switch-board, and provision is always made not only for the introduction of continuous current both direct from the mains and from the accumulators, but also of alternating and tri-phase currents. Further, in the case of the accumulator current various combinations of cells can be taken, so as to give within limits any desired potential. Provision is also made for introducing different resistances into the circuits. The electric lamp for projection is invariably placed on a platform situated in the middle of the auditorium, the screen being as large as the proportions of the room allow. There is sometimes a subsidiary arrangement such as a concave metallic mirror by which projection can be effected from the lecturer's table on a small screen situated above the former. The galvanometer that is used for demonstration purposes is permanently placed on a fixed bracket and the light of an electric incandescent lamp is reflected from its mirror on to a scale attached to the wall. In some cases there is a transparent scale fitted into the partition wall between the lecture-room and the preparation-room, and the galvanometer is then located in and worked from the latter.

19. Artificial illumination is provided by electric lamps, and in the case of those theatres which are fitted with a ceiling of dulled glass, the lamps (in this case arc-light) are placed above the ceiling so as to give a diffused light throughout the room. The lecturer's table is lighted by a special arrangement of incandescent lamps which can be raised or lowered at pleasure. The preparation-room naturally adjoins the lecture-room, and a very convenient arrangement which obtains in several of the more modern buildings is to have the two connected by a large aperture in the wall to which the black-board is fixed. The latter is always in two or even three portions, so arranged that the upper portions can be successively brought to the level of the lecturer, and when written over raised to their former height, so that a large amount of written matter remains in view of the students for a considerable time without deletion. Behind the lowest division of the board is the aperture referred to, and this may be used either as a means of communi-

cation with the preparation-room or for other purposes as well, such as, for instance, the projection from a lamp in the former on a pane of dulled glass inserted in the aperture.

Collection of instruments.

20. The third room, which is always found on the same floor with and close to the lecture-theatre, is that for the collection of instruments. The cases which hold the latter are made of glass, so that each instrument can be readily inspected. They are generally arranged so that one of the narrow sides of the case rests on the outside wall of the room, thus giving as large a glass surface for inspection as possible. Between every two cases there is a window, so as to admit ample light, and in front of each window a ledge or table on which any instrument, when it is removed from the case, may be placed. A room set aside for this purpose must necessarily be large and its fittings expensive, but where there is a valuable collection of instruments, suitable provision of this kind is eminently desirable, as, quite apart from the greater security gained for the apparatus and the convenience in readily laying one's hands on a particular instrument, the educational value of an exhibition of scientific apparatus of which every detail is open to inspection cannot easily be overrated.

21. These rooms—lecture-room, preparation-room, and instrument-room, besides the private room of the Director—are always placed next each other on the same floor, and this floor would in India be the first for reasons which have already been pointed out. The only other room besides those mentioned previously to which it has sometimes been found desirable to give a special situation is the optical-room for advanced work. If this be combined with a dark room and a photographic-room, it is generally found on the top-floor of the institute.

Special location of certain rooms.

22. To sum up, the rooms that have special locations are the workshops, machine and accumulator-rooms and perhaps a room for even temperature on the cellar-floor; the rooms for very accurate measurement on the ground-floor; the large lecture-theatre, the preparation-room, the room for the collection of instruments and the professor's room adjoining each other on the same floor—generally the first, and lastly the optical-room, with its accompanying dark and photographic-rooms on the top floor. The remaining rooms, *i.e.*,

those for special work, the general laboratories, and the rooms for the other professors and assistants, are located according to the exigencies of the site, and the space which is available after the essential requirements have been satisfied. It must, however, be remembered that in the case of a physical institute built anywhere in the plains of India, the impossibility of utilizing the cellar-floor would necessitate some modification of the general plan which has been outlined above. Before quitting this part of the subject, I should mention that a special library and reading-room is always attached to each institute. The library is well stocked with books of reference and current periodical literatures with regard to physical science, so that the student may have no difficulty in acquainting himself with all that has been done in the subject on which he is working.

Equipment.

23. German laboratories are liberally treated with regard to their permanent equipment as well as their annual requirements. Under the former head may be included everything that is necessary for a proper supply of electricity—such as dynamos, transformers, accumulators, etc.—the lathes and milling machines of the carpenter's and mechanic's shops, the machines necessary for the supply of compressed and rarified air on a large scale, the apparatus for the production of liquid air, and apparatus for the supply of other permanent requirements of a properly equipped physical institute.

Electric supply.

24. Most of the German universities are situated in towns which are provided with a general supply of electricity. Further, the supply is mostly of the continuous current form. When this is the case, electricity is introduced into the institute directly from the mains, and this direct current is itself supplied to different parts of the institute and used for various purposes. But the chief use made of this direct current is to charge the accumulators, with which every institute is provided on a more or less liberal scale and which then form the source of supply for the current distributed over the whole institute for the purposes of scientific work. The number of accumulators as well as their arrangement naturally varies to a slight extent in different universities, but for the sake of example Freiburg may be taken as representing

the requirements of an up-to-date institution. Here there are three batches of accumulators giving 72 volts each and taken together a current of about 500 ampéres. These batteries are used as a whole, not in detail. There are besides separate accumulators, which can be arranged in different groups, and which are connected with the various rooms in which electricity at small voltage is required. The accumulators are generally charged by means of a continuous-current transformer or motor-generator, by which the voltage of the mains is reduced to the requisite potential, or in some cases the same object is effected simply by the introduction of an appropriate resistance. There is further in every institute a transformer for changing continuous into alternating currents, and provision is also made for the production of tri-phase currents.

25. Where there is no electric supply in the town, the above system has to be to a certain extent modified and amplified by the addition of a gas-engine. This (as is the case in Giessen for example) drives a dynamo, which thus replaces the mains as far as the original supply of the electric current is concerned. Further, where the town supply is an alternating system, the current has first to be converted into a continuous one before it can be used for the purpose of charging the accumulators. In connection with the above electrical arrangements should be mentioned the high potential accumulator battery which is found in every physical institute and which is essential for a large number of researches in connection with electricity. These batteries, which yield of course a minimum of current, are seldom composed of less than 2,000 small cells, so that the available potential is at least 4,000 volts. They are conveniently charged in batches, sometimes directly from the mains by the introduction of an appropriate resistance as, for instance, that afforded by an incandescent lamp.

Liquid-air machines.

26. One of the most important machines found in modern German laboratories is the Linde machine for the manufacture of liquid air. The ease with which liquid air can now be preserved and handled by means of the Dewar glass bottles with double walls and a vacuum interspace has caused the installation of plant for its manufacture to be regarded as a necessity in every modern laboratory, since the

low temperatures which can be so conveniently produced and maintained by the evaporation of liquid air, have opened up a vast field of experimental research into the properties of matter under entirely new conditions. It is true that the development of the commercial aspect of the question and the consequent sale in Berlin and Munich of liquid air at something like 1*s.* 3*d.* a litre has rendered the necessity for separate laboratory installations less obvious, especially as liquid air can be transported by railway with the greatest ease from place to place; still it will clearly be a long time before its commercial production will be attempted in India, so that, if our representative laboratories are to keep pace with the times, provision must be made in them for the production of this indispensable adjunct of modern physical research. With regard to cost, the most complete and most modern plant was that which I saw at Freiburg, and the expense of this laboratory installation amounted to no more than £250.

Workshops.

27. Another important feature in German laboratories is the mechanic's shop. In every university and technical institute that I visited I found that the professors and assistants largely relied on the resources of their own workshop for the outturn of scientific apparatus. This was rendered possible partly by the entertainment of one or more mechanics of superior skill and training, partly by the provision of such tools and machines as would enable their skill and training to be utilized to the best advantage. In some institutions this department is more specially developed than in others, as for instance under Professor Lehmann at Karlsruhe but in all great importance is attached to the proper maintenance of the workshops, and the professors never fail to encourage the mechanics to attain as high a degree of proficiency as possible in their art, so much so indeed that the fame of the latter often extends beyond the limits of their own university. It should be noticed particularly in this connection that a great saving is effected by the provision of proper mechanics and an efficient staff of workmen, as a large number of instruments can thereby be turned out in the institute itself, which would otherwise have to be supplied at considerably greater expense by outside manufacturers.

28. Lastly, I may mention here as part of the permanent equipment the large pumps worked by motors for providing compressed or exhausted air. These pumps are located along with the other machinery in the cellar-floor, and are, as has been already mentioned, connected with the large lecture-theatre, being in fact generally placed for the sake of convenience immediately below it. Pumps for compressed and rarified air.

29. With regard to the other instruments, it is unnecessary to say much, as they naturally possess a somewhat ephemeral interest. The annual grant for an institute of moderate size averages about £200, but it must always be borne in mind, as has already been pointed out, that the purchases from manufacturers of scientific instruments are largely supplemented from the resources of the institute's own workshops. Additional grants are, moreover, frequently made for the purchases of apparatus which are required for special research. These several sources of supply are found more than sufficient to meet the wants of the various institutions, and the collections of instruments, both for the purpose of demonstration and of precise work, which I met with on my tour, were everywhere of the completest description. The instruments of the different institutes are of course not exact replicas of one another; there are little differences in detail both in class and laboratory apparatus representing for the most part the ideas of lecturers and assistants, who have occupied themselves with the question of improving the forms already in use. It is unnecessary, however, to particularize these, partly because their variety is too great, partly because instruments embodying any noteworthy novelty of construction are fully described in the catalogues of the various makers. Other instruments.

30. I may perhaps, however, mention one or two new forms, which seemed of special value and which had been adopted in several of the laboratories which I visited, *e.g.*—

A specially efficient galvanometer for high-class work, called the Panzer galvanometer by Siemens and Halske of Berlin.

Induction coils with ring-formed magnets, also coils of the old shape by Klingenfuess of Basel, both giving greatly improved results in comparison with the usual type of coil.

A mercury air-pump according to Neesen, manufactured by

Burger of Berlin. [A pentan thermometer by the latter firm graduated down to 200°C. may also be mentioned here.]

Quadrant-electrometer by Dolezalek, so sensitive that 1 volt gives a scale reading of 1,200 divisions; the needle being made simply of silver paper is so light that it is damped by the air alone.

Quartz vessels by Siebert and Kühn, Cassel, absolutely unaffected by heat.

German and English manufactures.

31. A few of the prominent German scientific instrument makers have been mentioned above, and I may now say a few words with respect to the merits generally of the products of their workshops. There can be no doubt that the manufacture of scientific instruments has been carried to a high pitch of perfection in Germany. This is only in accordance with the general spirit with which scientific education and research have been fostered in that country. It is natural enough that where the pursuit of science has been so eagerly taken up, a corresponding impetus should have been given to the manufacture of the apparatus which is indispensable to scientific education and to scientific research. Accordingly we find that the Germans occupy a prominent place among the manufacturers of scientific instruments in Europe. Not only is there a large number of makers who have attained a well deserved reputation for the construction of cheap and excellent apparatus for the lecture-room and the educational laboratory, but there is also a special class which has devoted itself more immediately to the manufacture of high-grade instruments for the purposes of research and accurate measurement. Most of these, specially the makers of electrical instruments, have a scientific laboratory attached to their workshops, in which, besides the usual testing work, experiments directed towards the improvement of apparatus are carried on by expert assistants. As regards the relative cost of instruments of German and English manufacture, it is difficult to make any precise comparison, as the instruments are of course not absolutely identical. There can, however, be little doubt that for most classes of instruments, whether for demonstration or accurate work, German makers quote considerably lower prices than their English confrères. In Vienna instruments are for the most part purchased from

Germany, but occasionally from England as well, Austria itself furnishing few first class manufacturers. The purchasers have therefore an opportunity of comparing German and English prices, and what I heard from them on this point fully confirmed the above conclusion. I append here the names of the most reputed German manufacturers of the various kinds of instruments employed in physical science. In electricity the makers enjoying the most solid and best deserved reputations are undoubtedly Messrs. Siemens and Halske, Berlin, Messrs. Hartmann and Braun, Frankfort-on-the-Main, and Dr. Edelmann of Munich, but I should mention in addition O. Wolff of Berlin, who, though less well known than the preceding, has, through the excellence of his workmanship combined with extremely moderate prices, secured for himself the support of many leading scientific institutions.

32. For the manufacture of glass apparatus of a general kind, R. Burger of Berlin has probably the highest reputation, though perhaps Geissler & Co., of Bonn, are better known outside Germany itself, for their work in this direction. Besides these, however, I should mention the special manufacture of glassware which is carried on at Jena, and which is famous throughout the world. There are two firms in this Saxon town which work in connection with each other—Schott and Genossen, and Karl Zeiss. The former are chiefly concerned with the manufacture of the famous Jena glass, which the latter turns to such good account in his optical instruments. It is here that the question of improving the manufacture of glass for lenses was first taken up scientifically by Professor Abbe, and the result of several years' continuous experiment on his part was a complete revolution in the methods previously employed for making optical glass. Another problem which was attacked was the perfecting of the glass used for thermometer tubes and here too complete success crowned the efforts of Professor Abbe and Dr. Schott, so much so indeed that the whole world now comes to Germany for high-grade scientific thermometers. An idea of the way in which science is enlisted in the service of German manufactures may be gained from the fact that the lens manufactory employs twenty and the glass-works five scientists on their respective staffs. Another firm which enjoys a reputation

equal to that of Karl Zeiss for the manufacture of optical instruments is Schmidt and Haensch of Berlin, but their specialty lies more in the construction of spectroscopes and polariscopes, in which indeed they stand unrivalled.

33. Manufacturers of other classes of instruments in Germany may be briefly mentioned: for balances, Sartorius of Göttingen and P. Bung of Hamburg; meteorological instruments, R. Fuess of Steglitz near Berlin; magnetic instruments, O. Toepfer and Son of Potsdam, as well as Dr. Edelmann of Munich already mentioned; general apparatus for demonstration and for educational uses in laboratories, Max Kohl of Chemnitz and F. Ernecke of Berlin; the former also makes a specialty of the fitting-up of class-rooms and laboratories (the excellence of his catalogues deserves perhaps special mention). There are of course numerous other excellent firms, but those I have mentioned occupy the foremost positions.

Standardizing of instruments of German manufacture.

34. One great advantage which manufacturers of scientific instruments in Germany possess is the opportunity which is afforded them of having the products of their workshops standardized by the Imperial Reichsanstalt at Charlottenburg. This magnificent institution, which was till quite recently unique in the scientific world, owes its origin to the genius of two illustrious Germans—Siemens and Helmholtz. It is under the control of a committee of professors of physical science selected from the various universities, and is divided into two sections, the physical and the technical. In the former purely physical investigations are carried on by scientists of special eminence appointed and paid by the State, who give up the whole of their time exclusively to the work of research. No expense is spared in the provision of the specially constructed and costly apparatus which their delicate and abstruse researches for the most part involve. The separate building in which this invaluable work is carried out is of unique construction and specially adapted for the various optical, electrical, thermal, and mechanical investigations to which it is given up. The continuous additions to our knowledge, which are the outcome of this systematic attack on the problems of physical science, are freely given to the world in various scientific publications, and an annual report is, moreover, issued by the Reichsanstalt itself summarizing the results of the

work which has been done in the year with which it deals. The actual nature of the researches will perhaps be more readily gathered from a perusal of one of these reports, a copy of which for the year 1902 is appended. It is the second section, however, of the Reichsanstalt which possesses more immediate interest with regard to the subject with which I am now dealing. It is in this section that questions of more directly practical importance are dealt with, and the exhaustive nature of the programme of work here carried on is the admiration and envy of scientists in all parts of the world. There are six different departments in the complex of buildings given up to this section, *i.e.*, the mechanical, electrical (comprising two sub-sections for high and low tension work besides a magnetic laboratory), thermometric and barometric, optical, chemical, and lastly the workshops. The chief work which is carried on in the first three of these departments is the testing and standardizing of the numerous measuring instruments which are submitted to the institute for this purpose. Thus, for instance, in the mechanical section scale-divisions on silver or steel, the calibration of wires, the number of vibrations of tuning-forks, etc., are tested; in the electrical section, voltmeters, ammeters, wattmeters, resistances, etc.; in the section for heat and pressure, barometers and the various instruments for measuring temperature. Should the instruments submitted satisfy certain conditions, they receive a certificate with the stamp of the Reichsanstalt showing the deviation from the standard or, in other words, the correction which has to be applied to bring them into agreement with this standard: otherwise they are rejected. But the work of standardizing measuring instruments is by no means the only work which is carried on at the Reichsanstalt. The optical department, for instance, is for the most part occupied with testing the illuminating power of different sources of light and of certifying how far this deviates from the standard, as well as with estimating the duration of the various kinds of electric lamps. Further, in the same department glass and other optical materials are tested for their optical properties, such as optical purity, the parallelism of plates, etc. In the electrical department insulators are tested for their electric resistance, and in all the departments substances are tested for their physical or chemical properties. Of special interest with respect to

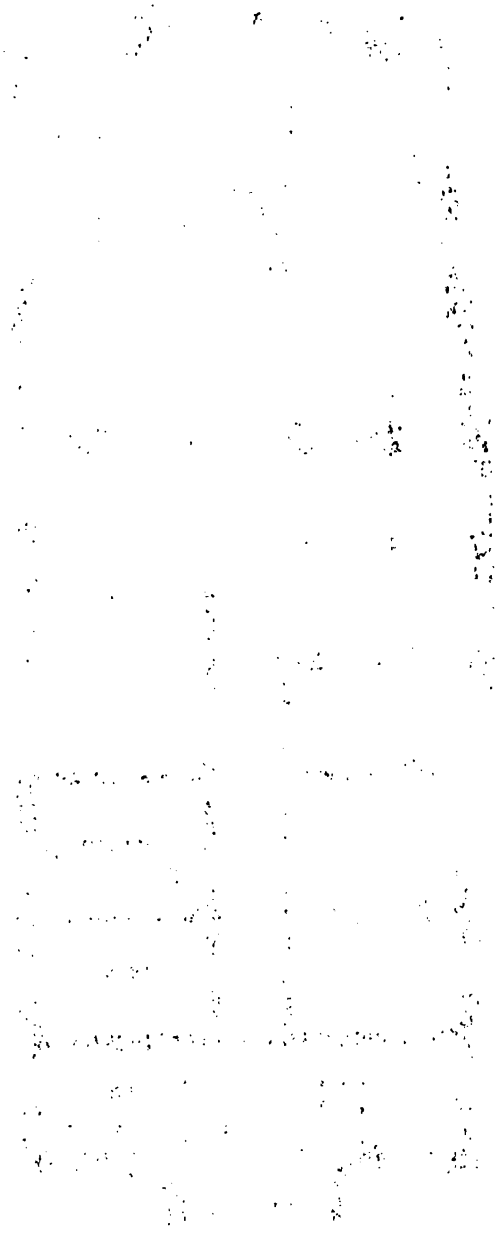
the latter are the experiments made with quartz and different kinds of glass with a view of testing and also improving their resistance to chemical action. In short, any physical or chemical investigation which has a direct technical application may be conducted in this the physico-technical section of the Anstalt. Lastly, there are the workshops where, to illustrate the ideas suggested by previous research, new apparatus is constructed or improvements are introduced into already existing types.

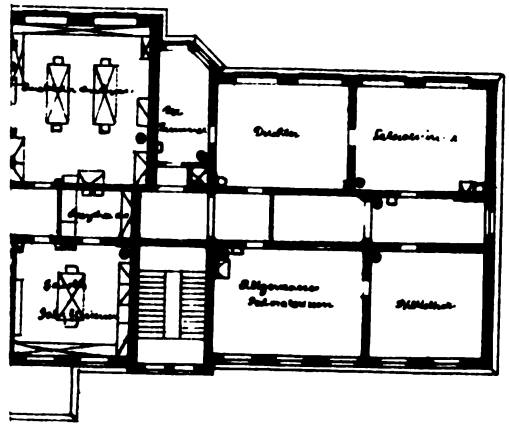
Such is a brief account of an institution of which Germany may justly be proud, and which has conferred a distinct though indirect advantage on the German manufacturers of scientific instruments, as every instrument which issues from these workshops can at a trifling cost be tested by the Reichsanstalt, and, if entitled to it, can secure the guarantee afforded by one of its certificates. The indirect stimulus alone, which such a system must give to accuracy and finish in workmanship, is of inestimable advantage to this branch of manufacture. It is true that many leading firms, both in Germany and England, possess their own private standardizing laboratories, but the certificate given by any private manufacturer, however reliable, is of course of little value compared with that issued as the result of the independent and searching tests carried out by a national institution of the nature of the Reichsanstalt. In England the Board of Trade issues certificates in the case of certain standards electrical and otherwise which it has undertaken to maintain, but its sphere of activity is extremely limited and inadequate. So apparent indeed have the needs of other countries become, more especially by contrast with the far-seeing action of Germany in this respect, that several similar institutions have lately been founded in different parts of the world. One of the latest of these is the national physical laboratory at Bushey Park in England, but alas, the German institution has had some fifteen years' start, and, moreover, it does not seem likely at present that the liberal pecuniary support necessary to make such a venture a success will be forthcoming. The Reichsanstalt cost alone in land and buildings some £250,000; it maintains a staff of ninety-five professors, scientific assistants and expert mechanicians, and it receives a handsome annual grant from Government for its maintenance. It is obvious therefore that for the present at least the

national physical laboratory cannot compare with its German rival and that its sphere of activity must be unduly limited by its inadequate resources.

G. W. KÜCHLER.

CALCUTTA;
June 1904.

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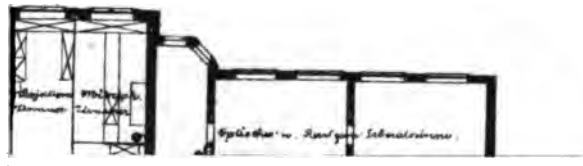

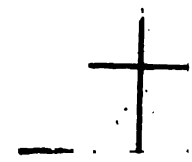

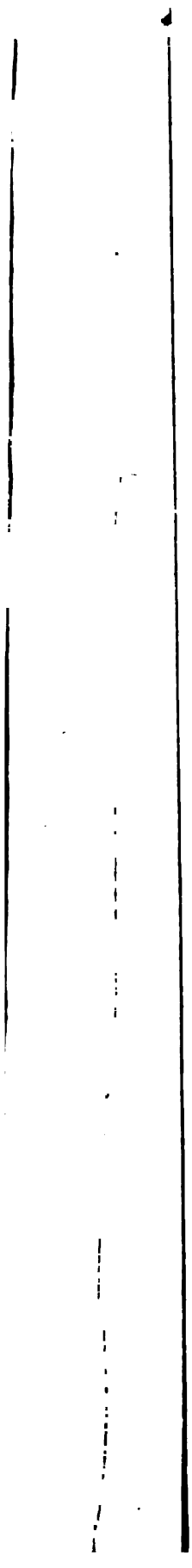

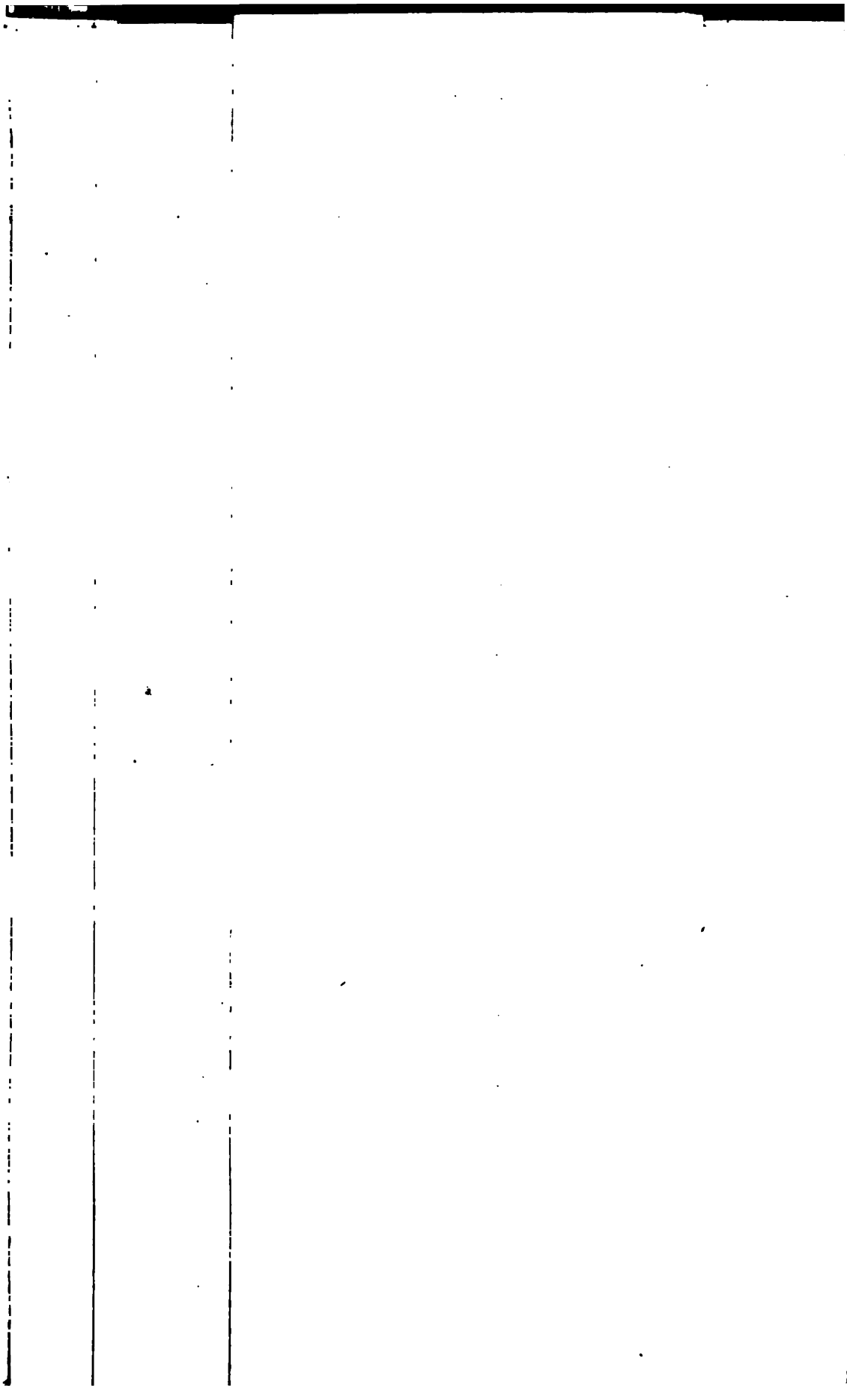

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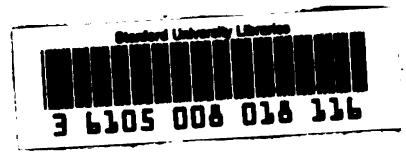


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